C 21.5: 972/3

Vol. 972 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 18, 1978

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

July 18, 1978 Volume 972 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty Information	972 OG 14
Reissue Applications Filed	972 OG 14
Patent Notices	
Certificates of Correction for the Week of July 18, 1978	972 OG 15
Disclaimers	972 OG 15
Errata	972 OG 15
National Technical Information Service	972 OG 15
Condition of Patent Applications	972 OG 17
Reissue Patents Granted (29,702)	895
Plant Patents Granted (4,280)	897
Patents Granted	
General and Mechanical (4,100,619)	899
Chemical (4,101,269)	1121
Electrical (4,101,724)	1245
Design Patents Granted (248,511)	1331
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 49
Classification of	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 54
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 55
Designs and Plants	PI 56
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,272,120, Re. S.N. 901,002, Filed Apr. 27, 1978, Cl. 101/56, ADDRESS PRINTING MACHINE WITH ROLLER PLATENS, Dean W. Johnson, Owner of Record: *Addressograph-Multigraph Corporation, Cleveland, Ohio,* Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 337

3,766,663, Re. S.N. 901,019, Filed Apr. 27, 1978, Cl. 34/168, PREHEATER FOR LIME KILN, Marshall F. Parsons, Owner of Record: *Detroit Lime Company, Detroit, Mich.,* Attorney or Agent: Paul F. Seibold, et al., Ex. Gp.: 344

3,770,727, Re. S.N. 905,569, Filed May 12, 1978, Cl. 260/240.8, NOVEL BASIC PYRAZOLINE DYES, Alfred Brack, Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Allan R. Plumley, et al., Ex. Gp.: 117

3,824,064, Re. S.N. 901,767, Filed May 1, 1978, Cl. 431/328, INFRA-RED PROCESS BURNER, Rudolph S. Bratko, Owner of Record: *Slyman Manufacturing Corp., Cleveland, Ohio,* Attorney or Agent: Lowell L. Heinke, Ex. Gp.: 344

3,892,139, Re. S.N. 904,004, Filed May 8, 1978, Cl. 74/116, VARIABLE SPEED TRANSMISSION, Trevor L. Harris, Owner of Record: *Harris Dynamics, Costa Mesa, Calif.,* Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 345

3,913,947, Re. S.N. 904,005, Filed May 8, 1978, Cl. 280/236, VEHICLE WITH VARIABLE SPEED TRANSMISSION, Trevor L. Harris, Owner of Record: *Harris Dynamics, Costa Mesa, Calif.,* Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 316

3,957,176, Re. S.N. 907,278, Filed May 18, 1978, Cl. 222/185, DISPOSABLE PUTTY DISPENSER, Lloyd E. Marston, Owner of Record: *Dynatron/Bondo Corporation, Atlanta, Ga.,* Attorney or Agent: Harold D. Jones, Jr., et al., Ex. Gp.: 311

3,980,751, Re. S.N. 909,589, Filed May 25, 1978, Cl. 423/54, ION EXCHANGE CHROMATE REMOVAL, Frank R. Foulkes, Owner of Record: *Huron Chemicals Limited, Kingston, Ontario, Canada,* Attorney or Agent: George H. Spencer, et al., Ex. Gp.: 113

3,988,647, Re. S.N. 899,096, Filed Apr. 21, 1978, Cl. 361/397, METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY, Donald A. Bolon, et al., Owner of Record: *General Electric Company, Schenectady, N.Y.,* Attorney or Agent: John F. McDevitt, et al., Ex. Gp.: 217

4,011,052, Re. S.N. 863,543, Filed Dec. 23, 1977, Cl. 75/231, ELECTRICAL CONTACT MATERIAL AND PROCESS, Terrence Ardern Davies, et al., Owner of Record: *Inventors,* Attorney or Agent: Richard T. Guttman, et al., Ex. Gp.: 223

4,011,053, Re. S.N. 863,542, Filed Dec. 23, 1977, Cl. 75/231, ELECTRICAL CONTACT MATERIAL AND PROCESS, Terrence Ardern Davies, et al., Owner of Record: *Inventors,* Attorney or Agent: Richard T. Guttman, et al., Ex. Gp.: 223

4,014,039, Re. S.N. 908,655, Filed May 23, 1978, Cl. 360/72, AUTOMATIC PROGRAM LOCATOR FOR TAPE DECKS, Tatsuhiro Yasunaga, Owner of Record: *Sharp Kabushiki Kaisha,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 235

4,020,854, Re. S.N. 907,274, Filed May 18, 1978, Cl. 132/9, DEVICE AND METHOD FOR PROGRAMMED HAIR COLORING, Lorenzo Caruso, Owner of Record: *Inventor,* Attorney or Agent: Alfons Puishes, Ex. Gp.: 333

4,022,481, Re. S.N. 907,962, Filed May 22, 1978, Cl. 277/96.1, COMPLIANT STRUCTURAL MEMBERS, John V. Long, et al., Owner of Record: *International Harvester Co., San Diego, Calif.,* Attorney or Agent: Richard D. Multer, et al., Ex. Gp.: 241

4,036,244, Re. S.N. 908,518, Filed May 22, 1978, Cl. 135/4 R, VERTICAL ARCH SHELTER, Carl F. Huddle, Owner of Record: *Tension Structures Company, Pleasant Ridge, Mich.,* Attorney or Agent: None, Ex. Gp.: 354

4,078,270, Re. S.N. 906,769, Filed May 16, 1978, Cl. 5/181, ADJUSTABLE BED-FRAME, Richard A. Nowell, Owner of Record: *Pressed Steel Corporation, Santa Fe Springs, Calif.,* Attorney or Agent: Max Dressler, et al., Ex. Gp.: 357

PATENT NOTICES

Certificates of Correction for the Week of July 18, 1978

3,903,131	4,058,489	4,075,704	4,079,531
3,935,789	4,058,933	4,075,731	4,079,760
3,951,960	4,059,659	4,076,658	4,079,775
3,953,414	4,060,443	4,076,946	4,079,856
3,968,434	4,061,698	4,077,004	4,079,912
3,980,457	4,061,828	4,077,008	4,079,931
3,997,706	4,062,160	4,077,360	4,080,013
4,005,179	4,064,369	4,077,401	4,080,056
4,009,796	4,064,574	4,077,613	4,080,291
4,031,229	4,065,044	4,077,616	4,080,314
4,033,792	4,065,250	4,077,710	4,080,427
4,034,973	4,067,260	4,077,714	4,080,440
4,037,155	4,067,845	4,077,731	4,080,600
4,038,064	4,069,069	4,077,762	4,080,608
4,047,408	4,069,907	4,077,866	4,080,765
4,049,049	4,071,606	4,078,099	4,080,938
4,052,362	4,071,814	4,079,242	4,080,949
4,055,003	4,073,946	4,079,313	4,080,958
4,057,547	4,074,418	4,079,317	4,081,871
4,057,833	4,075,358	4,079,455	4,082,140
4,058,359	4,075,399	4,079,456	

Disclaimers

3,438,706.—*Hiroshi Tanaka, Shinkichi Takahashi,* and *Tetsuo Hasegawa,* Tokyo, and *Toshihiko Sato,* Saitamaken, Japan. ELECTROPHOTOGRAPHIC DEVICE. Patent dated Apr. 15, 1969. Disclaimer filed Apr 18, 1977. by assignee. *Cannon Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1, 2 and 4 of said patent.

3,821,651.—*George H. Fathauer, Decatur, Ill.,* and *Cecil E. Mathis,* Indianapolis, Ind. SCANNING CONTROL CIRCUIT FOR USE IN SIGNAL-SEEKING RADIO RECEIVER. Patent dated June 28, 1974. Disclaimer filed May 25, 1978, by the assignee, *Masco Corporation of Indiana.*

Hereby enters this disclaimer to claims 1–19 of said patent.

3,873,924.—*George H. Fathauer,* Decatur, Ill. SIGNAL SEEKING RADIO RECEIVERS. Patent dated Mar. 25, 1975. Disclaimer, filed May 25, 1978, by the assignee, *Masco Corporation of Indiana.*

Hereby enters this disclaimer to claims 1–17 of said patent.

4,015,127.—*Allen J. Sharkins,* Lower Burrell, Pa. MONITORING FILM PARAMETERS USING POLARIMETRY OF OPTICAL RADIATION. Patent dated Mar. 29, 1977. Disclaimer filed June 5, 1978, by the assignee, *Aluminum Company of America.*

Hereby enters this disclaimer to all claims of said patent.

4,041,055.—*Kenneth Paul Shephard* and *Verlan H. Van Rheenen,* Portage, Mich. PROCESS FOR THE PREPARATION OF 17-HYDROXYPROGESTERONES AND CORTICOIDS FROM ANDROSTENES. Patent dated Aug. 9, 1977. Disclaimer filed May 22, 1978, by the assignee, *The Upjohn Company.*

Hereby enters this disclaimer to claim 84 of said patent.

4,081,152.—*Cyril Henderson,* Woodland Hills, Calif. DUAL TENSION RETRACTOR. Patent dated Mar. 28, 1978. Disclaimer filed May 30, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

Errata

All reference to Patent No. 4,090,595 to Hugh A. Zindler and Sheldon D. Pollow of Wisconsin for BRAKE RELEASED CLUTCH MECHANISM appearing in the OFFICIAL GAZETTE of May 23, 1978 should be deleted since no patent was granted.

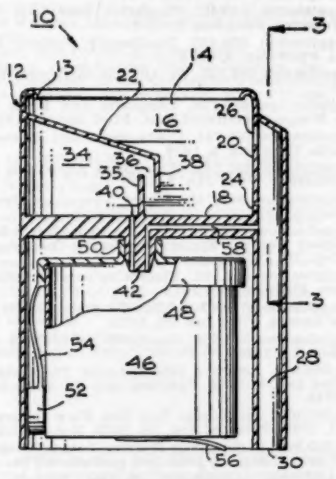
All reference to Patent No. 4,091,051 to Ronald Anthony Fava of Pennsylvania for THERMOPLASTIC MOLDING COMPOSITION COMPRISING STYRENE-MALEIMIDE AND POLYCARBONATE appearing in the OFFICIAL GAZETTE of May 23, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,093,494 to Wolfgang Neidhart of Switzerland for WELDING DEVICE FOR WELDING PLASTIC STRIPS appearing in the OFFICIAL GAZETTE of June 6, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,095,009 to Colin Anolick, Vivian Marie Robinson, and Charles Winfield Stewart, Sr. of Delaware for UPHOLSTERED FURNITURE HAVING IMPROVED FLAME RESISTANCE appearing in the OFFICIAL GAZETTE of June 13, 1978 should be deleted since no patent was granted.

SPECIAL ERRATUM

The drawing shown under Patent No. 4,040,791 on page 707 in the OFFICIAL GAZETTE of August 9, 1977 is in error. The following drawing should have been printed instead:



National Technical Information Service

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Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid pre-

mature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half Street, SW.
Washington, D.C. 20324

Patent application 706,048. Simplified High Accuracy Guidance System. Filed July 20, 1976.

Patent application 858,972. Laser Ranger Test System. Filed Dec. 9, 1977.

Patent application 863,026. Readily Curable Fluorocarbon Ether Bibenzoxazole Polymers. Filed Dec. 21, 1977.

Patent application 865,271. Monophospha-S-Triazines. Filed Dec. 28, 1977.

Patent application 865,467. Breech Closure Mechanism. Filed Dec. 29, 1977.

Patent application 865,754. 3db Hybrid Coupler Switch. Filed Dec. 29, 1977.

Patent application 865,755. Disappearing Alignment Marks for Election Beam Pattern Generation. Filed Dec. 29, 1977.

Patent application 866,143. Offset Correction Apparatus for a Successive Approximation A/D Converter. Filed Dec. 30, 1977.

Patent application 866,144. Modulating Vernier Flap Control System. Filed Dec. 30, 1977.

Patent application 866,185. Method for Prestressing Turbine Disks. Filed Dec. 30, 1977.

Patent application 866,187. Broadband Waveguide Lens Antenna and Method of Fabrication. Filed Dec. 30, 1977.

Patent application 866,189. Precision Pointing and Tracking Control System. Filed Dec. 30, 1977.

Patent application 866,432. Radiation Dose Rate Hardened Light Detector. Filed Jan. 3, 1978.

Patent application 866,433. Nonlinearly Variable Gain Apparatus. Filed Jan. 3, 1978.

Patent application 866,725. An Altitude Simulator. Filed Jan. 3, 1978.

Patent application 866,726. Composite Fan Blade Platform Double Wedge Centrifugal Seal. Filed Jan. 3, 1978.

Patent application 866,741. Containment and Release Device for Fluids. Filed Jan. 3, 1978.

Patent application 866,742. Wide Band Adjustable Brewster Angle Polarizer. Filed Jan. 3, 1978.

Patent application 866,743. Direct Frequency Synthesizer. Filed Jan. 3, 1978.

Patent application 868,354. A Selectable Servo Ratio and Dual Speed Control System for Large Centrifuge Units. Filed Jan. 10, 1978.

Patent application 868,355. Fluoroalkyleneether Silicate Copolymers. Filed Jan. 10, 1978.

Patent application 871,067. Adding Frequency Agility to Fire-Control Radars. Filed Jan. 20, 1978.

Patent application 871,866. Improved Fabry-Perot Diplexer. Filed Jan. 24, 1978.

Patent 4,068,903. Adaptive Skid Detector Threshold Apparatus. Filed Dec. 8, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,977. Jet Engine Tail Pipe Flow Deflector. Filed May 11, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,069,999. Spring Type Dogging Device. Filed Nov. 10, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,205. Aluminum Arsenide Eutactic Gallium Arsenide Solar Cell. Filed Dec. 8, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,591. Error Corrected Error Amplifier. Filed July 19, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,595. Apparatus for the Acceleration of Ions in the Virtual Cathode of an Intense Relativistic Electron Beam. Filed Dec. 8, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,636. Plural Loop Spark Gap RF Pulse Radiation Converter. Filed Nov. 24, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,071,864. Flexible Recording Head Mounting Assembly. Filed Jan. 16, 1976. Patented Jan. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Services Division., Federal Bldg., Agricultural Research Service
Hyattsville, Md. 20782

Patent application 880,000. Synthetic Cephalotaxine Esters Having Antileukemic Activity. Filed Feb. 22, 1978.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,986,490. Reducing Heat Loss From the Energy Absorber of a Solar Collector. Filed July 24, 1975. Patented Oct. 19, 1976. Not available NTIS.

Patent 4,018,654. Pretreatment of Coal During Transport. Filed Sept. 5, 1974. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,018,663. Coal Liquefaction Process. Filed Jan. 5, 1976. Patented Apr. 17, 1977. Not available NTIS.

Patent 4,025,317. High Pressure Rotary Piston Coal Feeder for Coal Gasification Applications. Filed Aug. 12, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,026,356. Method for In Situ Gasification of a Subterranean Coal Bed. Filed Apr. 29, 1976. Patented May 31, 1977. Not available NTIS.

Patent 4,032,618. Conversion of Ammonia Into Hydrogen and Nitrogen by Reaction With a Sulfided Catalyst. Filed May 11, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,069,867. Cyclic Flow Underground Coal Gasification Process. Filed Dec. 17, 1976. Patented Dec. 17, 1976. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent application 843,367. Method of Employing Oral TRH. Filed Oct. 19, 1977.

Patent application 855,910. 1,2-Diaminocyclohexane Platinum (II) Complexes Having Antineoplastic Activity. Filed Nov. 29, 1977.

Patent application 865,985. Enhancement of Cholesterol Combining Properties of Saponins. Filed Dec. 30, 1977.

Patent application 873,704. Powder Blower Device. Filed Jan. 30, 1978.

Patent 4,074,367. Prosthetic Load-Lift Hook Locking Mechanism. Filed Sept. 16, 1976. Patented Feb. 21, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 840,939. Fluidic Combustion of a Solid Fuel Ramjet. Filed Oct. 11, 1977.

Patent application 852,646. Parabolic Optical Waveguide Horns and Design Thereof. Filed Nov. 18, 1977.

Patent application 858,873. Wide Field-of-View Michelson Filter. Filed Dec. 8, 1977.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA Code GP-2, Washington, D.C. 20546

Patent application 873,993. A System for Delivering SIC14 to a Chemical Reactor. Filed Jan. 31, 1978.

Patent application 876,298. Drop Foot Corrective Device. Filed Feb. 9, 1978.

Patent application 876,299. Solar Cell Angular Position Transducer. Filed Feb. 9, 1978.

Patent application 876,440. Method and Apparatus for Eliminating Luminol Interference Material. Filed Feb. 9, 1978.

Patent application 876,441. A System and Method for Obtaining Wide Screen Schlieren Photographs. Filed Feb. 9, 1978.

Patent application 878,539. Attaching of Strain Gages to Substrates. Filed Feb. 16, 1978.

Patent application 878,540. Fuselage Structure Using Advanced Technology Metal Matrix Fiber Reinforced Composites. Filed Feb. 16, 1978.

Patent application 883,094. Spacesuit Mobility Joints. Filed Mar. 3, 1978.

Patent 3,514,785. Emergency Space-Suit Helmet. Filed Feb. 24, 1966. Patented June 2, 1970. Not available NTIS.

Patent 4,055,004. Full Color Hybrid Display for Aircraft Simulators. Filed Oct. 17, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,416. Tantalum Modified Ferritic Iron Base Alloys.. Filed Jan. 21, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,447. Directionally Solidified Eutectic Gamma-Gamma Nickel-Base Superalloys. Filed May 7, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,705. Thermal Barrier Coating System. Filed May 14, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,068,495. Closed Loop Spray Cooling Apparatus. Filed Mar. 31, 1976. Patented Jan. 17, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 20, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-22-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-11-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-1-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-5-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-3-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors: Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-10-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-3-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents..... Numbers 2,055 to 2,066, inclusive

REISSUES

JULY 18, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

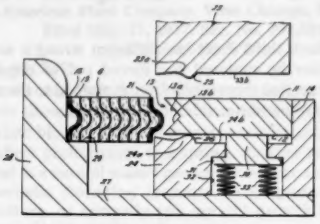
Re. 29,702
SPIRAL WOUND GASKET ASSEMBLY METHOD

A. B. Owen, and Bruce M. Gifford, both of Harris County, Tex., assignors to Lamons Metal Gasket Company, Houston, Tex.

Original No. 4,019,244, dated Apr. 26, 1977, Ser. No. 658,509, Feb. 17, 1976. Application for reissue Jun. 16, 1977, Ser. No. 807,314

Int. Cl.[2] **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 29—520 **9 Claims**



1. A method of forming a spiral wound gasket assembly having a gasket ring and an [ouer] *outer* metal gauge ring with flat [guide] *gauge* surfaces between an inner groove and an outer peripheral edge, wherein the improvement comprising the steps of:

forming a spiral gasket ring with the exterior diameter of the ring allowing positioning of the ring in the gauge ring groove;

positioning the gasket ring within the gauge ring; and

deforming a portion of the gauge ring to reduce the size of the gauge ring groove to tighten and retain the gasket ring within the groove.

Re. 29,703
NON-INVASIVELY MEASURING ARTERIAL OXYGEN TENSION

Irving Fatt, Berkeley, Calif., assignor to The Regents of The University of California, Berkeley, Calif.

Original No. 3,893,444, dated Jul. 8, 1975, Ser. No. 434,191, Jan. 17, 1974. Continuation-in-part of Ser. No. 273,422, Jul. 20, 1972, abandoned. Application for reissue Mar. 22, 1976, Ser. No. 668,867

Int. Cl.[2] **A61B** *5/00*

U.S. Cl. 128—2 E **14 Claims**

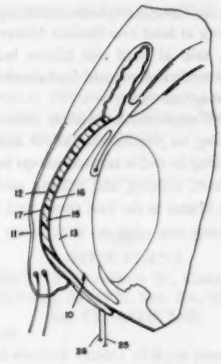
13. Apparatus for non-invasively indicating continuous arterial oxygen tension of a patient, comprising

1. a scleral contact lens member having an oxygen-sensing electrode assembly secured to said lens member and sensing at the outer surface thereof, so that said contact lens member can be placed between the cornea of the patient's eye and his eyelid,

2. means for applying voltage to said electrode,

3. means for sensing the current passed, and

4. means indicating said sensed current in relation to the oxygen tension as modified by factors corresponding to the relation



between the slope and origin of the arterial oxygen tension to palpebral conjunctival oxygen tension.

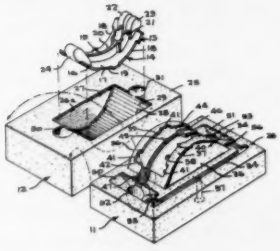
Re. 29,704
METHOD OF CASTING BRAKE SHOES

Harry D. Bradshaw, Cordele, Ala.; Roland W. McKenzie, Culpeper, Va., and Hunter R. McKinney, Laurinburg, N.C., assignors to Standard Forge and Axle Co., Montgomery, Ala.

Original No. 3,753,460, dated Aug. 21, 1973, Ser. No. 174,634, Aug. 25, 1971. Application for reissue Apr. 7, 1976, Ser. No. 674,319

Int. Cl.[2] **B22C** *9/22;* **B22D** *23/00*

U.S. Cl. 164—131 **8 Claims**



1. A method of casting a brake shoe having an arcuate table section and at least one rib section disposed on the concave side of said table section comprising forming at least one mold cavity and cooperating sprue, runner and riser cavities in the cope and drag sections of a mold assembly, so that the axis of curvature of the mold surface forming the outer surface of the table section of the resultant cast brake shoe is disposed substantially parallel to the parting plane of said cope and drag sections *forming said outer surface of said table section entirely in one of said sections as said continuous arcuate surface suitable for mounting a brake lining thereon,* assembling the cope and drag sections of the mold assembly so that said cavities are cooperatively related, pouring molten metal through said sprue and runner into said mold cavities, and removing the cast brake shoe from the mold assembly.

Re. 29,705

RUPTURABLE BLISTER PILL PACKAGE WITH SAFETY BACKING

Newton L. Compere, 3202 Heiden Dr., Lake Bluff, Ill. 62621

Original No. 3,809,221, dated May 7, 1974, Ser. No. 296,192, Oct. 10, 1972. Application for reissue May 4, 1976, Ser. No. 683,091

Int. Cl.[2] B65D *83/04*

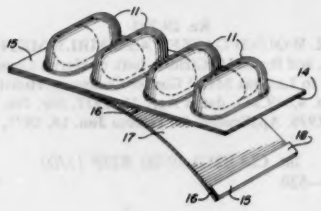
U.S. Cl. 206—531 15 Claims

1. A protective childproof package comprising:

a first sheet having at least one flexible blister which forms a compartment, said at least one blister being adapted to receive a *solid* medicament; said first sheet having a line of weakening along one edge;

a second sheet of rupturable material *coextensive with said first sheet having no perforations above said compartment, and* secured *along its entire surface, except below said blister,* to the first sheet, closing and sealing said compartment formed by the blister in the first sheet; and having a line of weakening along one edge so that when secured to the first sheet, the line of weakening in said first and second sheets are on the same edge of the package; and

a third imperforate sheet *coextensive with said second sheet and* sealably secured *along its entire surface* to the second



sheet which third sheet has sufficient strength so that it can neither be ruptured nor forced out of engagement with the second sheet when force is applied to the medicament from the blister side of the package.

PLANT PATENTS

GRANTED JULY 18, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,280

CHRYSANTHEMUM PLANT

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 17, 1977, Ser. No. 798,089

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by its medium sized white blooms which appear in a clubby spray formation, its excellent performance as a spring, summer and fall potted plant and as a natural season garden flower, its uniform 7-week photoperiodic flowering response under greenhouse potted plant culture, its normally tall, upright growth habit, and its tolerance of high soluble salt conditions.

4,281

ROSE PLANT

Samuel D. McGredy, P.O. Box 14-100, Auckland, New Zealand

Filed Sep. 19, 1977, Ser. No. 834,504

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by high centered, attractive bicolored flowers with thick petals and good substance, borne primarily singly and having a spiral, circular outline, and a vigorous, upright growing plant habit, with long stems and large foliage, and of particularly good disease resistance.

4,282

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia St., Ontario, Calif. 91761

Filed Sep. 29, 1977, Ser. No. 837,747

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of Rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very large cherry pink to a rosey red bloom, the bloom comprising exceptionally large individual petals, with a large quantity of petals, the large quantity and size of petals providing a much more rounded large bud, the petals being translucent and appearing to be almost silken and of great substance, the ability to hold longer as a garden flower and cut rose, and the plant being less leggy and open with fewer thorns and more waxy foliage leaflets.

PATENTS

GRANTED JUL. 18, 1978

ERRATA

For CLASS	See PATENT NO.
242–031	4,100,658
180–006.2	4,101,004
400–144.3	4,101,006
400–124	4,101,017
400–582	4,101,018
229–034 R	4,101,048
229–002.5 R	4,101,049
229–003.5 R	4,101,050
229–017 R	4,101,051
229–023 R	4,101,052
296–037.7	4,101,062
235–092 MT	4,101,071
366–142	4,101,116
272–097	4,101,136
350–096.24	4,101,188
428–624	4,101,328
250–504	4,101,424
521–028	4,101,460
521–032	4,101,461
521–115	4,101,462
521–088	4,101,464
521–118	4,101,465
521–115	4,101,466
521–079	4,101,467
521–115	4,101,468
521–083	4,101,469
521–118	4,101,470
521–121	4,101,471
521–085	4,101,472
526–193	4,101,513
528–109	4,101,514
252–182	4,101,515
528–112	4,101,516
528–271	4,101,517
528–100	4,101,518
528–197	4,101,519
528–248	4,101,520
528–242	4,101,521
528–292	4,101,522
528–309	4,101,523
528–288	4,101,524
528–309	4,101,525
528–179	4,101,526
528–073	4,101,527
528–067	4,101,529
528–045	4,101,530
528–315	4,101,531

528–311	4,101,532
528–491	4,101,533
544–408	4,101,546
544–294	4,101,547
544–284	4,101,548
544–301	4,101,549
544–387	4,101,550
165–014	4,101,886

PATENTS

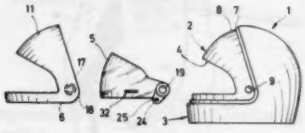
GRANTED JULY 18, 1978

GENERAL AND MECHANICAL

4,100,619
PROTECTIVE HELMET

Corina Piëch, Gänkopf No. 30, 7000 Stuttgart 1, Fed. Rep. of Germany, and Wolfram Schleicher, Stuttgart, Fed. Rep. of Germany, assignors to Corina Piëch, Stuttgart, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,151
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603490; Mar. 2, 1976, 2608626; Aug. 23, 1976, 7626308[U]
Int. Cl.² A61F 9/00
U.S. Cl. 2—10 **7 Claims**

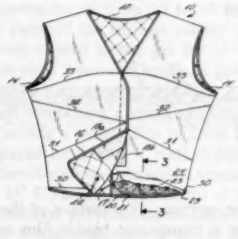


1. A protective helemt, comprising
(a) a hollow generally hemi-spherical helmet shell member (**41**) open at its bottom end and including a front portion containing a viewing window opening (**44**);
(b) an annular transparent visor member (**45**) arranged concentrically within said shell member opposite said window opening, said visor member being arranged with its axis extending vertically, said visor member having a diameter corresponding generally with the horizontal diameter of said shell member and containing a window opening; and
(c) means (**42, 43**) connecting said visor member with said shell member for rotation about its vertical axis, said visor member being rotatable between an open position in which said visor window opening and said helmet shell window opening are in alignment, and a closed position in which the transparent portion of said visor member is opposite said helmet shell window opening.

4,100,620
BODY PROTECTOR

Ann Pecoraro, 389 W. Valley Stream Blvd., Valley Stream, N.Y. 11580

Filed Feb. 20, 1976, Ser. No. 659,831
Int. Cl.² A41D 1/04
U.S. Cl. 2—102 **7 Claims**

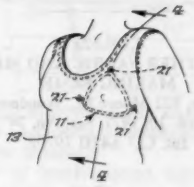


1. A protective garment for sports use comprising:
an outer ply of cloth;
an inner ply of cloth;
a ply of foamed polyethylene padding between said inner and outer plies of cloth;
a ply of fibrous padding between the said ply of foamed polyethylene padding and said inner ply of cloth; and the plies of cloth and padding being permanently stitched together.

4,100,621
ARTIFICIAL BREAST AND NIGHTGOWN INCORPORATING SAME

Marion Carol Ettipio, 70 Alma Ave., Buffalo, N.Y. 14215

Continuation-in-part of Ser. No. 603,542, Aug. 11, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,090
Int. Cl.² A41D 9/00
U.S. Cl. 2—114 **3 Claims**



2. A nightgown suitable for fastening thereto of a mastectomy prosthetic article which is a light weight substantially breast-shaped pad of substantially equilateral triangular outline shape when viewed from the front thereof, with a lower side of the triangle being substantially horizontal and with the other two upper sides being rounded, with the pad being of rounded substantially conical shape when viewed from a side, and being composed of a substantially conically shaped front wall, fibrous shaping material sufficient to hold the front wall in desired breast shape and a convexly arcing back wall fastened to the front wall about the sides thereof and retaining the shaping material in the pad, a hook tape held to the upper corner of the pad and extending substantially vertically and away from the pad and hook tapes held to each of the lower corners of the pad and extending substantially horizontally and away from the pad, with the hooks of the hook tapes being on the sides of such tapes facing the nightgown when the article is attached to the nightgown and with the tapes being outside the triangular outline of the pad which comprises pile tapes permanently fastened on the inside of a bosom area of the nightgown and adapted to have the hook tapes of the mastectomy prosthetic article fastened to them to hold such article in place on the inside of the nightgown, while pile tapes are of areas greater than those of the hook tapes and extend beyond the edges of such hook tapes so as to facilitate adjustable fitting of the prosthetic article to the nightgown.

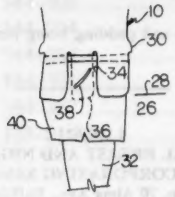
4,100,622
SHIRT CONSTRUCTION

James Edwin Juelg, Jr., 4514 Hamlin, Corpus Christi, Tex. 78411

Filed Aug. 30, 1976, Ser. No. 718,477
Int. Cl.² A41D 27/20
U.S. Cl. 2—115 **7 Claims**

1. An article of apparel comprising
a shirt substantially larger than infant size providing
a torso encircling portion having
a front, a back and a pair of sides; and
a lower peripheral edge residing between the belt line and the thigh of a wearer, the peripheral edge having a pair of reentrant slots, on a side of the torso encir-

cling portion, defining a flap therebetween, the flap being positioned to overlie a pocket on the pants of a



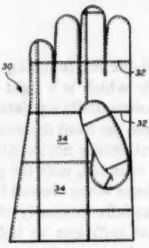
wearer and being freely liftable to provide access to said pocket.

4,100,623

GENUINE LEATHER FABRIC AND METHOD FOR MAKING SAME

Murray Strongwater, 822 Moore St., Woodmere, N.Y. 11598

Filed Feb. 10, 1977, Ser. No. 767,508
Int. Cl.[2] A41D *19/02*
U.S. Cl. 2—158 **3 Claims**



1. A genuine leather glove comprising a plurality of single layer, unsupported geometrical sections cut from genuine leather left over scrap, said sections being of selectively predetermined configurations and being secured to each other in end-to-end and side-by-side relation to form a continuous piece having ornamental characteristics imparted thereto by said secured together sections of predetermined geometrical configuration, said piece being cut into a panel comprising left and right portions in mirror symmetrical relation to each other, each of said portions including four discrete upwardly extending elongated segments, said left and right portions being stitched to each other along their outer and upper periphery to define a glove body having four finger stalls, one of said panel portions having an opening the contour of which has secured thereto a thumb stall made from said piece, whereby the entire glove has imparted thereto the ornamental characteristics of said continuous piece.

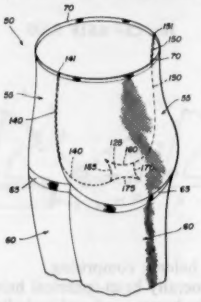
4,100,624

METHOD AND APPARATUS FOR FORMING A COMBINATION GARMENT AND PRODUCTS THEREOF

Farris L. Davis, West Fork, Ark., assignor to Bear Brand Hosiery Co., Chicago, Ill.

Filed Jul. 12, 1976, Ser. No. 704,700
Int. Cl.[2] A41B *9/04*
U.S. Cl. 2—409 **9 Claims**

1. A method of forming a combination garment having a crotch area therein from a crotch piece and two circularly knit tubular blank members each having a leg portion and an upper portion terminating in an open end, the method comprising simultaneously slitting the blank members between the open ends thereof and the areas thereof corresponding to the crotch area of the combination garment to provide longitudinally extending free edges thereon while firmly gripping the blank members adjacent to said free edges and along substantially the entire length of said edges, continuously seaming the free edges on the two blank members between first aligned points adjacent to the open ends thereof and a first predetermined point adjacent to the crotch area to provide a first seam and between a second predetermined point adjacent to the crotch area and second aligned points opposite the first aligned points and adjacent to the open ends of said blank members to provide a second seam, the first and second predetermined points at the



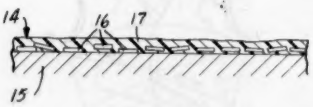
inner ends of the first and second seams in the crotch area being spaced apart to provide an opening to receive the crotch piece therebetween, aligning one edge of the crotch piece with one of the free edges on the blank members between the seams in the crotch area and seaming the aligned edges between the crotch end of one of the seams and the crotch end of the other of the seams, and aligning the other edge of the crotch piece with the other of the free edges on the blank members between the seams in the crotch area and seaming the aligned edges between the crotch end of one of the seams and the crotch end of the other of the seams, thereby to form a completed combination garment.

4,100,625

HELMETS AND OTHER ARTICLES REFLECTORIZED WITH RETROREFLECTIVE PLATELET PARTICLES

Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 743,889, Nov. 22, 1976, abandoned, which is a division of Ser. No. 592,744, Jul. 2, 1975, Pat. No. 4,004,930. This application Jul. 18, 1977, Ser. No. 816,583
Int. Cl.[2] A42B *1/06*
U.S. Cl. 2—410 **6 Claims**

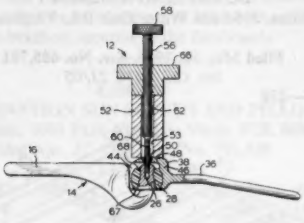


1. An article carrying on a surface of the article a coating that comprises a transparent binder film and retroreflective platelet particles dispersed in said film; said platelet particles comprising flat segments cut from a larger retroreflective sheeting; the shortest dimension of a face of the segments averaging at least about one-and-one-half times the thickness of the segments and the segments including a monolayer of retroreflective elements optically exposed over at least one face of the segments; the index of refraction of said binder film being such that said segments retroreflect light incident on the film.

4,100,626
WRIST IMPLANT APPARATUS

Robert Charles White, Beamsville, Canada, assignor to Ontario Research Foundation, Mississauga, Canada

Filed Apr. 29, 1977, Ser. No. 792,124
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 6 Claims



1. A wrist implant apparatus comprising:
a radial component having an elongated portion for insertion into the radius,
a support portion integral with one end of the elongated portion, and a pin member integral with and supported by the support portion, the pin member being centrally waisted and having its axis substantially at right angles to the said elongated portion,
a ring of low-friction material, the ring having a part-spherical outer surface and a central passageway shaped to be complementary with and to receive said pin member, and
a metacarpal component having an elongated portion for insertion into a metacarpal bone, and a receiving portion defining a part-spherical cavity adapted to receive said ring snugly but rotatably.

4,100,627
LOW OILING GEL FILLED FLEXIBLE ARTICLES AND GELS THEREFOR

Alfred P. Brill, III, Laurinburg, N.C., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 690,706, May 27, 1976, abandoned. This application Dec. 29, 1976, Ser. No. 755,322
Int. Cl.[2] A61F *1/24;* A41C *3/10*
U.S. Cl. 3—36 12 Claims

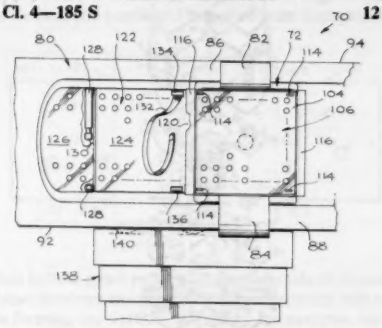
1. A gel filled flexible article comprising a flexible container having at least a portion of the container wall composed of silicone rubber which is less than 0.0015 meters thick and said silicone rubber comprising a gum which is essentially polydimethylsiloxane, said container containing silicone gel which at least contacts the container wall composed of silicone rubber, said gel has a penetration of from 10 to 60 millimeters and produces a linear swell of the silicone rubber when said silicone rubber is encapsulated in the gel for 21 days at room temperature of less than 5 percent, and said gel comprising a crosslinked essentially polydimethylsiloxane.

11. A silicone gel comprising a crosslinked essentially polydimethylsiloxane having a penetration of from 20 to 60 millimeters being prepared by mixing a methylphenylvinylsiloxy endblocked polydimethylsiloxane having a viscosity of 0.1 to 6 pascal-seconds at 25° C., a sufficient amount of a dimethylhydrogensiloxy endblocked polydimethylsiloxane having a viscosity of less than 5 pascal-seconds at 25° C. to provide an effective viscosity for the methylphenylvinylsiloxy endblocked polydimethylsiloxane of from 4.5 to 30 pascal-seconds at 25° C., a polymethylsiloxane having an average of at least three silicon-bonded hydrogen atoms per molecule present in an amount to provide a ratio of silicon-bonded hydrogen atoms to vinyl radicals in the total composition of from 0.3 to 0.74 and a catalytic amount of a compatible platinum catalyst, and thereafter curing the composition to obtain a gel.

4,100,628
ADJUSTABLE SAFETY SEATING DEVICE FOR BATHTUBS

Gertrude K. Franzl, 105-25 65th Ave., Forest Hills, N.Y. 11375

Filed Feb. 19, 1976, Ser. No. 659,378
Int. Cl.[2] A47K *3/12*
U.S. Cl. 4—185 S 12 Claims



1. An improved adjustable safety seating device for bathtubs, said device comprising, in combination:
a. a support frame including:
1. a plurality of interconnected, tubular, longitudinally-extending frame members,
said frame members including a plurality of substantially parallel and horizontally extending telescoping members supported by and conforming to the contour of the base portion of a bathtub,
said frame members further including a plurality of substantially parallel and vertically extending members lying adjacent to and conforming to the contour of the inner sides of said bathtub, and
2. frame adjustment means to enable adjustment of the frame members to bathtubs having variable inside dimensions, and
3. a seat anchoring means including an anchor post and seat positioning means enabling vertical adjustment of a seat member with respect to said anchor post, and
b. a seat including:
1. a generally horizontal, porous, body-supporting top, and
2. a generally vertical center post depending from said top and connected to said anchor post through said seat positioning means.

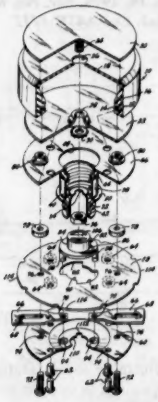
4,100,629
AIRCRAFT LAVATORY DRAIN PLUG

Kendall Jones, North Hollywood, and Boyce M. Hill, Los Angeles, both of Calif., assignors to Viking Industries, Inc., Chatsworth, Calif.

Filed Feb. 7, 1977, Ser. No. 766,017
Int. Cl.[2] A47K *1/14*
U.S. Cl. 4—295 27 Claims

1. A drain plug for axial insertion into a conduit having an inner surface, including
a cup-shaped resilient member having a closed end and an open end and having a sidewall having an outer surface and conforming in configuration to the inner surface of the conduit and with the thickness of the sidewall tapering at the inner wall of the member from the open end to the closed end and thicker at the open end and with the cup-shaped member in a relaxed state slidable into the conduit and in a compressed state having at least the portion of the sidewall adjacent the closed end flexed radially outward and sealed against the inner surface of the conduit,
a first clamp plate disposed on the outer surface of the closed end of the cup-shaped member,
a seal plate disposed to close the open end of the cup-shaped member and spaced from the first clamp plate,
sealing means intercoupling the first clamp plate and the seal plate for providing relative axial movement of the clamp

plate and the seal plate for providing a first spaced relationship between the clamp and the seal plates with the cup-shaped member in the compressed state and for providing a second spaced relationship between the clamp and the seal plates with the cup-shaped member in the relaxed state.



4,100,630

RECLINING FURNITURE

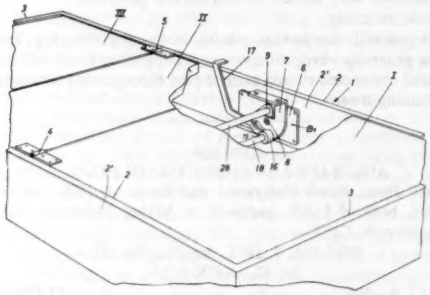
Odo Klose, Am Freudenberg 19, D-5600 Wuppertal 1, and Alfred von Schuckmann, Nordstrasse 32 a, D-5657 Haan, both of Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,457

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602638; Oct. 29, 1976, 2649460

Int. Cl.[2] A47C *3/32*; A61G *7/10*

U.S. Cl. 5—66 **17 Claims**



1. Reclining furniture having rest surfaces formed in at least two parts, defining rest surface sections hingedly connected with one another, and arranged adjustable in inclination to achieve a seating position such that a gore disposed in the range of a hinge axis is lowered during the raising of a raiseable of the rest surface sections, comprising

a border frame of the reclining furniture having opposite inner surfaces,

two mounting means arranged opposite one another on said opposite inner surfaces of the frame for supporting the raiseable rest surface section and each of said mounting means including

a pivot axle means including a pivot axle for operatively pivotally mounting the raiseable rest surface section, said pivot axle being spaced from the gore and disposed under the raiseable rest surface section,

a second axle,

a lever mounted in pendulum manner on said second axle, said pivot axle being mounted on said lever,

means for blocking at least the pendulum movement of said lever.

4,100,631

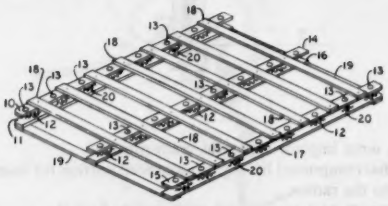
BOX-SPRING ASSEMBLY

Norman Slone, 3954-626 Water Oak Rd., Virginia Beach, Va. 23452

Filed May 13, 1976, Ser. No. 685,781

Int. Cl.[2] A47C *23/05*

U.S. Cl. 5—239 **7 Claims**



1. A box-spring assembly for use with a conventional bed frame for cooperatively receiving a mattress comprising two pairs of longitudinally extending side support members and at least one pair of intermediate support members, said pairs of support member being spacially aligned and having a top and bottom portion with resilient means therebetween, each resilient means being spaced from said support members by independent upper and lower guard means, said guard means having a hardness greater than said support member, said guard member having sufficient area dimensions to protect said support member when said resilient member is in its compressed configuration, said top portion includes a series of apertures for access to said resilient means, a plurality of transverse bracing members connected to said pairs of support members to maintain spacial alignment of said support members whereby the weight from a mattress placed thereon will be evenly distributed.

4,100,632

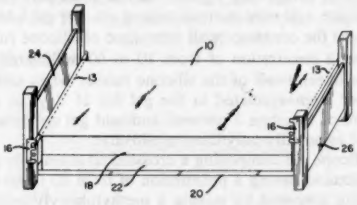
BEDDING

Anna M. Johnson, 37331 Park Ave., Willoughby, Ohio 44094

Filed Aug. 30, 1976, Ser. No. 718,837

Int. Cl.[2] A47G *9/04*

U.S. Cl. 5—334 R **1 Claim**



1. In combination with a mattress supported on a frame having a headboard and a footboard, a bottom sheet comprising a flat rectangular panel of a size to cover the top of said mattress, means securing the ends of the bottom sheet to the headboard and footboard comprising a hem provided at each end of the bottom sheet, rods positioned in said hems with said rods having ends extending outwardly beyond the edges of said bottom sheet and having wedge-like projections on said extending ends, first spaced brackets secured to said headboard adjacent the top corner of said mattress and at a lower level

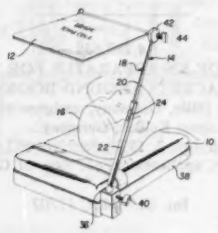
than second spaced brackets secured to said footboard adjacent the bottom corner of said mattress, each of said brackets being provided with a plurality of vertically spaced notches adapted to receive said wedge-like projections on the ends of said rods, a top sheet and other bedclothing having hems at the foot ends thereof accommodating similar rods, whereby the bottom sheet is secured to appropriate notches in the brackets secured to the footboard and headboard to hold said bottom sheet under tension and the top sheet and other bedclothes are secured at their foot ends in others of said vertically spaced notches in the brackets secured to the footboard.

4,100,633

COMBINATION SUN SCREEN AND PILLOW

Jose Luis Pintos, 1004 Park Plz., Isla Verde, P.R. 00913

Filed Apr. 27, 1977, Ser. No. 791,329
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—337 **1 Claim**



1. In a combination sun screen and pillow comprising:
(a) a pillow;
(b) a sun screen; and
(c) first means mounting said sun screen on said pillow such that, in use, said sun screen shades the face of the person resting his head on said pillow,
the improvements wherein:
(d) said first means comprises:
(i) at least one telescopically extensible rod whereby the distance between said pillow and said sun screen can be adjusted;
(ii) universal joint means for varying the angle between said pillow and said telescopically extensible rod, whereby said rod can be swung in both directions in the plane of said pillow in order to adjust the orientation of said sun screen relative to said pillow; and
(iii) means for varying the angle between said sun screen and said telescopically extensible rod;
(e) said sun screen comprises second means for holding a book open and in place on the side of said sun screen adjacent to said pillow, whereby a person resting his head on said pillow can read the book;
(f) said sun screen comprises a mirror carried on the side of said sun screen adjacent to said pillow, whereby a person resting his head on said pillow can use said mirror;
(g) a radio is mounted in or on said pillow; and
(h) said pillow contains a double compartment for the retention of the personal belongings of the person using the device.

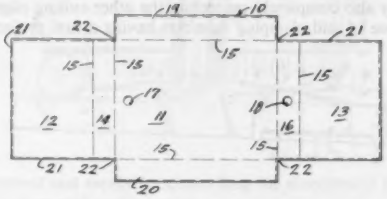
4,100,634

WATER MATTRESS CONSTRUCTION

Gary L. Benjamin, Mount Blanchard, Ohio, assignor to Kuss Corporation, Findlay, Ohio

Filed Oct. 6, 1976, Ser. No. 729,906
Int. Cl.[2] A47C *23/02, 23/04*
U.S. Cl. 5—365 **1 Claim**

1. A water mattress of three-dimensional, rectangular box-like construction fabricated from a unitary sheet of flexible material, said sheet being contoured to include only a top panel, a pair of vertical side panels integral with and folded downwardly on either side of said top panel, a pair of top and bottom vertical end panels integral with and folded downwardly at either end of said top panel, a first bottom panel portion folded horizontally inwardly from the lower edge of one of said vertical end panels, a second bottom panel portion folded horizontally inwardly from the lower edge of the other of said vertical end panels and in lapped seam engagement with



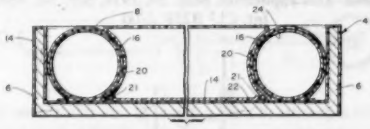
said first bottom panel portion on the underside of the mattress, a lap seam between the adjacent edges of adjacent side and end panels forming the vertical corners of the mattress, lap seams between the adjacent edges of said downwardly folded side panels and the edges of said horizontally and inwardly folded bottom panels, and at least one means within said mattress for filling or evacuating fluid therefrom.

4,100,635

WATER BED CONSTRUCTION

Michael W. Mitchell, 606 Esplanade, Redondo Beach, Calif. 90277, and James C. Hauser, 26621 Westvale Rd., Palos Verdes, Calif. 90274

Filed Jan. 31, 1977, Ser. No. 764,388
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—368 **8 Claims**



1. An improved water bed structure comprising the combination:
a. a water bed frame having a four-sided configuration and forming a compartment;
b. at least two spaced apart, separate, independent and distinct, about parallel, expansible members along two opposed lateral edges of said compartment and adapted to be selectively expansible along the depth of said compartment and to form a continuum surface with a separate water mattress, hereinafter defined; and
c. an independent and separate water mattress overlying said at least two expansible members and being retained within said compartment.

4,100,636

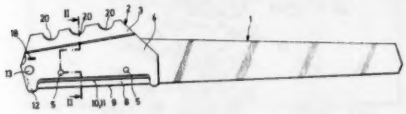
CUTTER

Theodor Ott, Mönthal, and Max Gaisser, Zollikerberg, both of Switzerland, assignors to Theodor Ott, Mönthal, Switzerland

Filed Sep. 19, 1975, Ser. No. 614,781
Claims priority, application Switzerland, Jul. 18, 1975, 9425/75
Int. Cl.[2] B25F *1/00*; B26B *29/00*
U.S. Cl. 7—158 **12 Claims**

1. A cutter, particularly a grass edge cutter, comprising a handle; a blade having two elongated cutting edges spaced from each other in a direction transverse to the direction of elongation of said cutting edges and each formed with opposite end regions spaced from each other in said direction of elonga-

tion; and means for supporting said blade on said handle, having a pair of clamping members operative for clamping said blade therebetween in an operative position, and for releasing said blade so as to detach the latter therefrom, said clamping members in said operative position protecting at least one of said end regions of one of said cutting edges from wear whereas the remainder of said one cutting edge is exposed, and said clamping members in said operative position simultaneously also completely protecting the other cutting edge, at least one of said clamping members having a first projecting



portion located in the vicinity of said one end region of said one cutting edge and extending for a predetermined distance in a first direction transverse to said direction of elongation and beyond said one cutting edge so as to protect said one end region of said one cutting edge from wear, and a second projecting portion located in the vicinity of said other cutting edge and extending for a predetermined distance in a second transverse direction substantially opposite to said first transverse direction and beyond said other cutting edge so as to completely protect said other cutting edge.

4,100,637

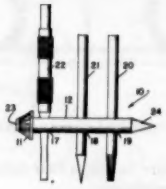
COMBINATION TOOL

Fred J. Grieser, Sr., 1417 Barton Rd., Lake Worth, Fla. 33460, and Fred J. Grieser, Jr., 101 Neptune Dr., Hypoluxo, Fla. 33462

Continuation-in-part of Ser. No. 604,112, Aug. 13, 1975, abandoned. This application Mar. 24, 1976, Ser. No. 669,765

Int. Cl.[2] B25F *1/00*

U.S. Cl. 7—158 **7 Claims**



1. A combination tool comprising a chuck key having a fixed bevel gear and a shaft extending from said bevel gear, said gear engaging a like bevel on a drill holding chuck for actuating said chuck, a plurality of openings formed in said shaft and a plurality of tools mounted on said shaft, a blow receiving area at one end of said shaft and a tapered pointed end at the opposite end thereof for forming a marker point on a surface by imposing a blow on said blow receiving area.

4,100,638

FORGING MACHINE

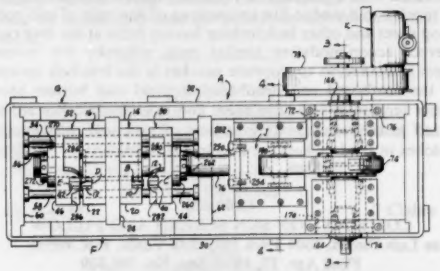
Donald A. Fischer, Strongsville, Ohio, assignor to Kalt Manufacturing Company, North Ridgeville, Ohio

Filed Mar. 21, 1977, Ser. No. 779,348

Int. Cl.[2] B21K *1/44*; B21J *9/18, 13/04*

U.S. Cl. 10—15 **11 Claims**

1. A forging machine comprising a stationary frame, a stationary die support incorporated in or fixed with respect to said frame, a second die support, a crankshaft rotatably supported in said frame by adjustable tapered roller bearings, means for rotating said crankshaft, a connecting rod or pitman operatively connected to said crankshaft by adjustable tapered roller berings and to said second die support by adjustable tapered roller bearings to move a die carried thereby to and



from a die carried by said stationary die support upon rotation of said crankshaft.

4,100,639

METHODS OF AN APPARATUS FOR WRAPPING JACKETS AROUND BOOKS

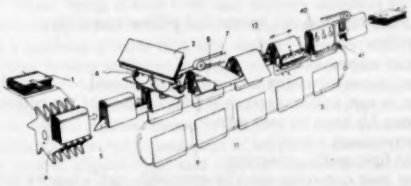
Günter Dietrich, Hille, Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Germany

Filed Jun. 2, 1977, Ser. No. 802,624

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620047

Int. Cl.[2] B42C *11/02*

U.S. Cl. 11—1 R **17 Claims**



1. A method for the application of jackets to books comprising the steps of:

opening the covers of the book outwardly from the book block to angles of approximately 30°;

depositing an unfolded jacket sheet on the book, the jacket sheet being in contact with the book in the spine region thereof intermediate the ends of the sheet;

folding edge portions of the jacket about the oppositely disposed front edges of the book cover with the aid of heat to form jacket flaps; and

closing the book cover.

4. In apparatus for the automatic application of jackets to books, said apparatus including a conveyor mechanism which transports the books along a predetermined path, the improvement comprising:

means for opening the covers of a book on the conveyor mechanism outwardly with respect to the book block;

roller means for supporting the opened covers at substantially equal predetermined angles with respect to a plane passing through the book block in a direction parallel to the block defining pages;

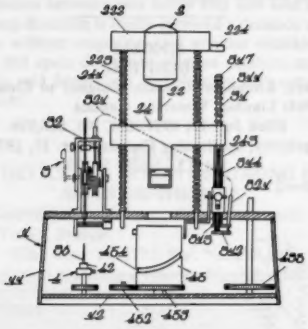
means for depositing an unfolded jacket sheet on the book, the jacket sheet contacting the book in the region of the spine thereof intermediate the edges of the sheet;

means for contacting and urging the jacket sheet downwardly and into contact with the covers whereby the jacket sheet will be pulled tightly over the book spine;

means for folding opposite edge portions of the jacket sheet about the front edges of the book covers to define a pair of jacket flaps; and

means for heating the jacket sheet where it passes about the front edges of the book covers.

4,100,640
BINDING MACHINE
Yasukatsu Takimoto, Sakai, Japan, assignor to Nakabayashi Kabushiki Kaisha, Osaka, Japan
Filed Aug. 11, 1977, Ser. No. 823,878
Claims priority, application Japan, Aug. 11, 1976, 51-96559
Int. Cl.[2] B42C *19/00*
U.S. Cl. 11—1 R **5 Claims**



1. A binding machine comprising:

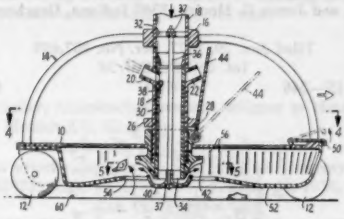
means for forming a binding bore through stacked papers to be bound having a drill adapted to be raised and lowered with respect to a base of the machine for forming the binding bore, and pressing members for pressing stacked papers, supported by a support plate for said drill through a spring and adapted to be lowered accompanying said drill, said pressing member having a retaining rod for retaining the lowered position of said drill;

means for feeding plastic tube of a predetermined length adapted to be started by an actuation of a starting rod adapted to be moved as said drill is driven into said stacked papers to form said binding bore, so as to feed said plastic tube by a length substantially equal to the thickness or height of said stacked papers, said means for feeding plastic tube being further adapted to sever the fed plastic tube during the upward movement of said drill; and

means for forming a binding cord adapted to bring a lower heating mold provided at its center with a receiving needle adapted to be supplied with the severed plastic tube and an upper heating mold into alignment with the binding bore formed through said stacked paper and into engagement with each other, said means for forming the binding cord being further adapted to raise said lower heating mold to insert said severed plastic tube into said binding bore until the upper end of said severed plastic tube comes to be pressed to said upper heating mold, so as to melt the upper and lower ends of said plastic tube and form these ends into respective flanges, thereby to form said binding cord.

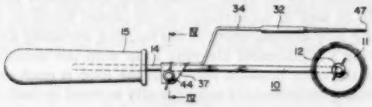
4,100,641
SWIMMING POOL CLEANERS
Andrew L. Pansini, 180 Los Cerros Dr., Greenbrae, Calif. 94904
Filed Jun. 24, 1976, Ser. No. 699,304
Int. Cl.[2] E04H *3/20;* **A47L** *5/00*
U.S. Cl. 15—1.7 **20 Claims**

4. An automatic pool cleaner comprising a wheel-supported carrier, a water supply conduit, tube means mounted on the carrier for receiving water from said conduit, drive jet nozzle means associated with said tube means to receive water from the latter and drive said carrier, means for controlling the direction of flow of water from said nozzle means to thereby control the direction of movement of said carrier, and means responsive to the ambient pressure condition of said pool water



to control said means for controlling the direction of flow of water from said nozzle means.

4,100,642
PAINT ROLLER AND BRUSH COMBINATION
Charles K. Gabor, Astoria, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Feb. 23, 1977, Ser. No. 771,071
Int. Cl.[2] A46B *15/00;* **B05C** *17/02*
U.S. Cl. 15—114 **1 Claim**



1. A paint roller unit to which a paint brush unit is adjustably mounted so that the brush unit may simultaneously contact a surface against which the roller of the roller unit is rolled,

said roller unit formed of a paint roller rotatably mounted to a crank arm, said crank arm lying substantially in a single plane and terminating in a straight handle section extending substantially perpendicular to the axle section of the crank arm and pointing away from the general mid-point thereof,

said brush unit formed of a plurality of bristles fixed, lying in a plane substantially parallel to the handle section, fixed to a first section of a sheet member and overlying the paint roller, with a second opposed section of said sheet member bent as a U-shaped clamp section of a size to fit about the straight handle section of the roller unit, said first and second sections of the sheet member joined by an intermediate section that extends at an angle to the said first and second sections so as to orient the said first section in a plane substantially parallel to and spaced from the said handle section of the roller unit in the attached position of the brush unit to the roller unit,

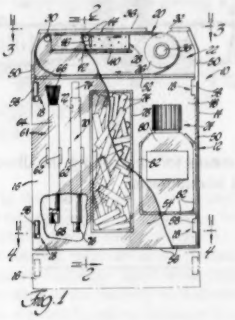
said clamp section of the roller unit formed with a hole in each leg of the U-shaped section, with a bolt mounted in one of said holes and threadably engaged to the other of said holes such that tightening of said bolt serves to adjustably clamp the legs of the clamp section together about the straight handle section of the roller unit, said handle section and said clamp section of a size to permit adjustment of the position of the bristles with respect to the roller in a direction parallel to the axis of the handle section when said bolt is loosened.

4,100,643

MAGNETIC TAPE SENSING HEAD CLEANER

Richard C. Horian, 1740 Strickland Dr., Bloomfield Hills, Mich. 48013, and James G. Horian, 7340 Indiana, Dearborn, Mich. 48126

Filed Jun. 20, 1977, Ser. No. 807,699
Int. Cl.[2] G11B *3/58*
U.S. Cl. 15—246 **6 Claims**



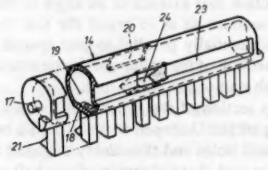
1. A magnetic tape sensing head cleaner comprising: a hollow housing including a pair of housing members; said housing including an intermediate wall dividing the housing into a cleaning loop compartment on one side thereof and a storage compartment on the other side thereof; the housing also including an apertured end wall spaced from the intermediate wall located on said one side thereof; latch means for fixedly securing the housing members to each other in a closed position while selectively permitting repeated relative movement therebetween to an open position and subsequent movement back to as well as securement in the closed position; and said cleaning loop compartment of the housing including a track for receiving a replaceable cleaning loop with the housing members in the open position such that the loop is enclosed when the housing members are subsequently secured to each other in the closed position and moves around the track adjacent the apertured end wall to clean a magnetic tape sensing head positioned adjacent the end wall, the housing members being movable to the open position to permit replacement of the cleaning loop when the loop is no longer capable of cleaning the sensing head.

4,100,644

VACUUM CLEANER NOZZLE WITH ROTATABLE COMB-SHAPED PART

Erik Karl Gustav Johansson, Sollentuna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation-in-part of Ser. No. 651,166, Jan. 21, 1976, abandoned. This application Mar. 4, 1977, Ser. No. 774,319
Claims priority, application Sweden, Jan. 29, 1975, 7500974
Int. Cl.[2] A47L *9/06*
U.S. Cl. 15—397 **4 Claims**



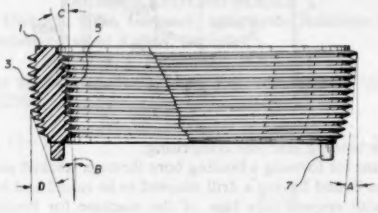
1. In a vacuum cleaner nozzle having a suction channel for conducting dust-laden air to a dust container the improvement comprising a hollow housing connected to said suction channel, an elongated part having a body and a comb; said body having spaced first and second channels extending in different planes, means mounting said part in said housing for rotation therein and positioning said part adjacent to the surface to be cleaned; the teeth of said comb being hollow and open at their free ends; the opposite ends of said teeth being connected to said first channel; in a first position of said rotatable part, said comb being in an extended position, whereby an air flow path is formed through said hollow teeth, said first channel and said suction channel; and in a second position of said part said comb being retracted into a position within said hollow housing whereby an air flow path is formed through said second channel and said suction channel.

4,100,645

BUSHING

Earl Meyers, Kitchener, Canada, assignor to Clemmer Industries (1964) Limited, Waterloo, Canada

Filed Jul. 15, 1977, Ser. No. 815,896
Claims priority, application Canada, Apr. 18, 1977, 276353
Int. Cl.[2] B65D *55/00*
U.S. Cl. 16—2 **9 Claims**



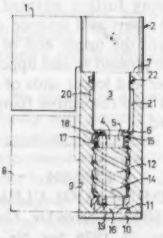
1. A bushing for use with an underground storage tank, consisting of a wall having inner and outer screw threads, the outer thread being a standard taper of 1°47′ over most of its length, and the inner thread being a non-standard larger taper than the outer thread over most of its length, the outer thread having a taper for the last few threads at its smallest outer diameter of the bushing of a larger angle than the major part of the outer thread.

4,100,646

SELF-CLOSING HINGE

Ewald Ingemar Emanuel Schubeis, Tegnergatan 9, S-111 40 Stockholm, Sweden

Filed Feb. 28, 1977, Ser. No. 772,740
Int. Cl.[2] E05F *3/20*; E05D *11/02*
U.S. Cl. 16—54 **7 Claims**



1. A hinge for supporting a door and the like in a frame therefore in such a manner that the hinge lifts the door vertically upwards, when the door is swung out of the frame and upon release of the door automatically swings the door back into the frame under the action of the weight of the door, said hinge comprising a first and a second hinge member adapted to

be secured to said door and said frame, respectively, said first hinge member including a hinge bolt and said second hinge member including a sleeve comprising an upper cylindrical portion in which said hinge bolt is rotatably and axially displaceably journalled and a portion at its lower end provided with an internal thread, a ring member in the lower portion of said sleeve, said ring member having an external thread cooperating with the thread in said sleeve, said hinge bolt having a lower end portion journalled in a non-rotatable but axially displaceable manner in said ring member and said hinge bolt having a downwardly facing annular shoulder located within said sleeve and above said lower portion of said hinge bolt, the arrangement being such that said ring member upon initial relative rotation between said hinge bolt and said sleeve in a door-opening direction is freely screwed a distance upwards in said sleeve without engaging said annular shoulder on said hinge bolt and upon continued relative rotation engages said shoulder on said hinge bolt and thereby lifts same together with the door.

4,100,647

PIVOT DEVICE FOR DOORS OF STRONG BOXES, SAFES OR THE LIKE

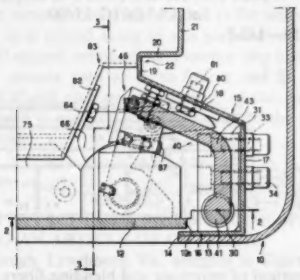
François Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed May 18, 1977, Ser. No. 798,189

Claims priority, application France, May 25, 1976, 76 15810

Int. Cl.[2] E05D *11/10, 3/06*

U.S. Cl. 16—139 **6 Claims**



1. In a container such as a safe having an opening and a swinging door attached thereto; a pivot device which comprises:

a shaped section including first and second branches, the first branch having a free end, said second branch having an end, a first pivot shaft connected to the free end of said first branch of the section, said pivot shaft being rotatably mounted in said container,

pivot means attached to the end of the second branch of the section and having an axis parallel to that of said first pivot shaft, said door being attached to said pivot means,

a rocker, a second pivot shaft rotatably mounting said rocker on said shaped section, said second pivot shaft having an axis extending parallel to the axes of said first pivot shaft and said pivot means, said rocker including a tooth and a curved portion.

an element mounted on the inner face of said door and having a curved portion complementary with said curved portion of the rocker, said element further having a recess,

said curved portions of said element and said rocker being positioned to contact each other and said recess being positioned to receive said tooth of the rocker,

first stop means for said rocker for preventing rotation of said rocker when said complementary curved portions contact each other in order to allow the rotation of the door around the pivot means,

second stop means on the shaped section positioned so that the door comes in contact with said second stop means at the end of a first movement of opening of the door by rotation around said pivot means, and

spring means for urging the tooth of the rocker into the recess during a second movement of opening of the door by rotation around said first pivot shaft.

4,100,648

HINGE

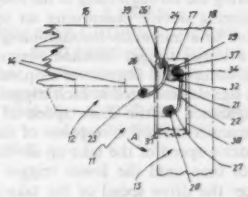
Kurt Krautter, Alpirsbach, Germany, assignor to Hetal-Werke Franz Hettich KG, Germany

Filed Jul. 7, 1976, Ser. No. 703,306

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1975, 2530321; Oct. 24, 1975, 2547602; Jan. 30, 1976, 2603465

Int. Cl.[2] E05D *3/06*

U.S. Cl. 16—163 **19 Claims**



1. A hinge comprising a first part adapted to be fastened to a furniture body and a second part adapted to be fastened to a door, said parts being interconnected for relative movement by means of a pair of guide links which are each mounted on pivots on said respective first and second parts of the hinge so as to constitute an articulated arrangement for lifting the door off the furniture body when the former is being opened, at least one of said pair of guide links being eccentrically arranged relative to an axis of its pivot connected to said second part, and the location at which said one guide link applies its force eccentrically on said pivot being rotatable around the axis.

4,100,649

METHOD AND APPARATUS FOR PRODUCING A UNIFORM TEXTILE FIBER SLIVER

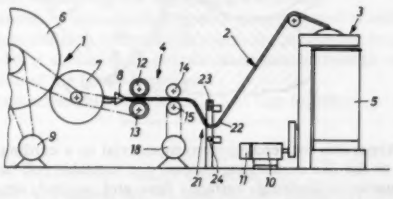
Hans Erismann, Fislisbach, and Werner Graf, Freienbach, both of Switzerland, assignors to Graf & Cie. A.-G., Rapperswil, Switzerland

Filed Sep. 21, 1976, Ser. No. 725,245

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543839

Int. Cl.[2] D01G *31/00;* **D01H** *5/32*

U.S. Cl. 19—0.2 **14 Claims**



1. An apparatus for producing a uniform textile fiber sliver, comprising: a sliver supply device for delivering a fiber sliver, a take-up device for the fiber sliver, means for driving the take-up device independently of the supply device, a regulation drafting arrangement located between the supply device and the take-up device, said regulation drafting arrangement comprising a pair of measuring rolls and a pair of drafting rolls, means for independently driving said pair of drafting rolls, means for driving one of the measuring rolls of the pair of

measuring rolls by means of the supply device, the other measuring roll being deflectable as a function of the change in thickness of the fiber sliver guided between the measuring rolls, regulation means for regulating the drive speed of the pair of drafting rolls and the take-up device as a function of the deflection of said other measuring roll and for the additional regulation of the drive speed of the take-up device as a function of the length of the fiber sliver between the pair of drafting rolls and the take-up device, a measuring value receiver connected with the regulation means, said measuring value receiver generating signals proportional to the drive speed of the supply device and the measuring roll driven thereby, said signals being delivered to the regulation means as an additional guide magnitude and processed therein for regulating the drive speed of the pair of drafting rolls and the take-up device, a monitoring device cooperating with the regulation means and arranged between the pair of drafting rolls and the take-up device for monitoring the through-hang of the loop of the fiber sliver, said monitoring device comprising an upper trigger location responsive to a minimum through-hang of the fiber sliver loop and a lower trigger location responsive to the maximum through-hang of the fiber sliver loop, said regulation means processing signals generated at each trigger location for the additional regulation of the drive speed of the take-up device in such a manner that upon response of the upper trigger location the drive speed of the take-up device is reduced for such length of time until the lower trigger location responds, whereafter the drive speed of the take-up device is increased for such length of time until the upper trigger location again response, and stop means operatively connected to the sliver supply device to stop said supply device when the drafting magnitude of the regulation drafting arrangement assumes a value falling outside of a fixed range.

4,100,650

ADJUSTABLE FEED PLATE

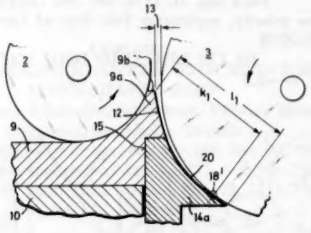
Walter Wirth; Robert Siegmund, both of Dulmen, and Wilhelm Borgert, Rorup, all of Fed. Rep. of Germany, assignors to Hergeth KG Muschinenfabrik und Apparatebann, Fed. Rep. of Germany

Continuation of Ser. No. 567,409, Apr. 11, 1975, abandoned. This application Sep. 28, 1976, Ser. No. 727,442

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1974, 2418413

Int. Cl.[2] D01G *15/40*

U.S. Cl. 19—105 **7 Claims**



1. Apparatus for feeding fibrous material to a carding machine or the like ocmprising at least one rotatable roll having an exterior cylindrical surface, first and second separate curved surfaces both in opposing relationship to said cylindrical surface and defining therewith a trough through which is adapted to pass the fibrous material, said first surface preceding said second surface in the direction of travel of the fibrous material through said trough, said second surface defining an immediate generally unbroken smooth continuation of said first surface, said trough including an entrance end portion defined by an upstreammost end of said first surface and said cylindrical surface adapted to initially receive the fibrous material, said trough having an exit end portion defined between said second surface and said cylindrical surface from which is adapted to exit the fibrous material, said trough progressively curvingly convergingly tapering in a direction from said entrance end portion toward said exit end portion, said trough having a minimum cross-sectional dimension established between said cylindrical surface and said second surface defining a tear-off point for the fibrous material, said tear-off point being upstream of said exit end portion, an imaginary straight line through said tear-off point being in tangential relationship to said second surface and said cylindrical surface, and the radius of curvature of both said first and second surfaces is identical and corresponds to the radius of said first surface defining the maximum cross-sectional dimension of said trough.

4,100,651

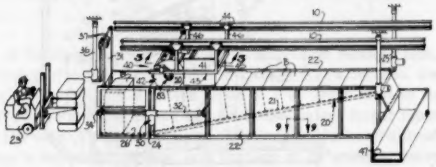
APPARATUS AND METHOD FOR REMOVING AND BLENDING FIBERS FROM A PLURALITY OF FIBER BALES

William D. Wornall, Charlotte, N.C., and Nick Valk, Greeneville, Tenn., assignors to Aldrich Machine Works, Greenwood, S.C.

Filed Jun. 22, 1977, Ser. No. 808,781

Int. Cl.[2] D01G *13/00*

U.S. Cl. 19—145.5 **12 Claims**



1. A method of removing and blending fibers from a plurality of fiber bales, said method comprising

positioning a predetermined number of fiber bales in a row in abutting relation on a horizontally oriented elongate support having an input end and an output end,

slowly moving the output end of the elongate support upwardly to move and reposition the support from the horizontal orientation to a predetermined inclined orientation while repeatedly moving a fiber removing device in a predetermined substantially horizontal path of travel along the row of bales while engaging uppermost portions of the bales with the fiber removing device and removing fibers from the bales to thereby maintain the upper surface of the bales lying substantially in the horizontal path of travel,

repeatedly moving the fiber removing device and removing fibers from the bales after the bale support has reached the predetermined inclined orientation, while engaging the endmost fiber bale at the input end of the now inclined bale support and pushing such endmost bale up the inclined support to thereby advance the entire row of bales along the support toward the output end and to also cause the upper surfaces of the respective fiber bales to be moved upwardly closer to the fiber removing device, and

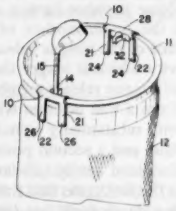
periodically positioning at least one fresh fiber bale at the input end of the bale support and pushing such bale toward and into engagement with the next adjacent fiber bale on the bale support to thereby replenish the supply of fiber bales on the bale support.

4,100,652

GOLF CLUB ANCHOR

Fred E. Carlson, New City, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,421
Int. Cl.[2] A63B 55/00
U.S. Cl. 24—3 R 2 Claims



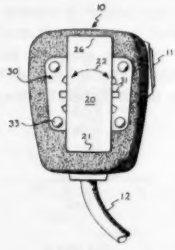
1. An anchor clip shaped to detachably fit about the opposed sides of the rim of a golf club bag and formed with a clamp clip of a size to detachably camp about a golf club shank, said clamp clip extending, when the device is installed on a golf club bag, in the radial direction towards the central axis of the attached golf club bag; in which the anchor clip is shaped with a pair of spaced U-shaped members, each said U-shaped member formed of a pair of legs oriented in substantially parallel configuration to each other and to the legs of the other U-shaped member, with both U-shaped members joined to a common mid-section, with the clamp clip shaped as a U-shaped member mounted at its mid-section to the said common mid-section so as to extend along an axis perpendicular to that of the spaced U-shaped members, said anchor clip mid-section bent along an arcuate path so as to follow and fit above a circular rim of a golf club bag when each of the pair of U-shaped members are engaged about the sides of the rim of a said golf club bag.

4,100,653

DEVICE FOR ATTACHING A MICROPHONE-SPEAKER TO AN ARTICLE OF CLOTHING

Paul F. Sensabaugh, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 16, 1977, Ser. No. 825,089
Int. Cl.[2] A45F 5/02
U.S. Cl. 24—3 J 13 Claims



1. An improved arrangement for removably attaching a microphone-speaker and the like to thin material such as clothing and the like comprising:

a. a first flat surface having a plurality of depressions spaced along a circular arc spaced a selected radial distance from a center;

b. a spring rotatably attached to said surface at said center and extending from said center for a distance at least as great as said radial distance;

c. said spring having a flat surface contacting said first flat surface and having a projection facing said first flat surface for engaging said depressions in said first flat surface;

d. a clip pivotally mounted on said spring and extending from its pivotal mounting in a direction towards said center to an engaging end of said clip;

e. means for resiliently urging said clip engaging end toward said first flat surface for removably holding said thin material between said engaging end and said first flat surface;

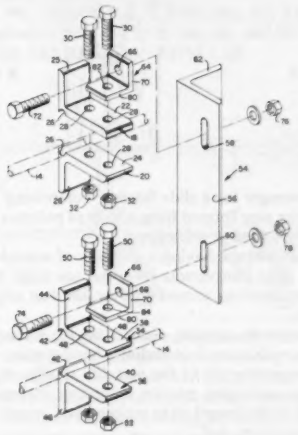
f. and said flat spring being resiliently urged to cause said projection to engage said first flat surface and to fit into one of said depressions in response to said flat spring being rotated to the desired location, thereby locating said clip at the desired rotational position with respect to said flat surface.

4,100,654

MECHANISM FOR GRIPPING HOOPS ENCIRCLING BUILDING STRUCTURES

Sheng P. Sheng, Williamstown, W. Va., assignor to Marietta Concrete Company, Marietta, Ohio

Filed May 6, 1977, Ser. No. 794,528
Int. Cl.[2] E04B 1/32
U.S. Cl. 24—20 R 7 Claims



1. A mechanism for gripping hoops encircling a structure, comprising:

first and second angles having first legs abutting each other and second legs for engaging the structure;

channels of semi-circular cross-section provided in said first legs defining when said first legs are in abutting relationship a substantially circular passageway through which one of the hoops passes; and

means adjustably securing said first legs together.

4,100,655

BELT BUCKLE

Gregory A. Langley, 200 W. 16th St., New York, N.Y. 10011

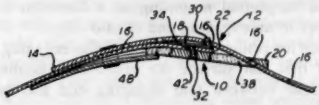
Filed May 10, 1976, Ser. No. 684,590
Int. Cl.[2] F41B 13/04; A45C 11/10; A44B 11/20
U.S. Cl. 24—163 K 5 Claims

1. A buckle for a belt of the type having a plurality of regularly spaced holes along a first end and the buckle engaged with the second end, or similar wearing apparel, comprising:

(a) a substantially rigid buckle member having a loop for receiving therethrough the first of two ends of the belt; and

(b) interlocking means permanently affixed to the second

end of the belt releasably interlocking with the first end of the belt, after the first end has been passed through said



loop, and releasably interlocking with said buckle member.

4,100,656

SLIDE FASTENER STRINGER AND METHOD OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 539,642, Jan. 9, 1975, Pat. No. 3,975,802. This application Jan. 12, 1976, Ser. No. 648,428

Int. Cl.[2] A44B *19/40*

U.S. Cl. 24—205.16 C **57 Claims**

1. A stringer for a slide fastener comprising

a carrier tape formed from a strip of polymer film longitudinally folded at one edge;

said carrier tape having a plurality of spaced slits formed in the strip transversely over the one edge defining looped strap portions extending over the one edge between the slits;

a continuous coupling element having a plurality of successive sections each including a head portion extending from a respective slit of the plurality of slits, and including an interconnecting portion extending through a respective one of the looped strap portions and joined with an adjoining section; and

a plurality of reinforcing sections of fiber secured to the strip and extending transverse the one edge of the strip over the respective interconnecting portions.

4,100,657

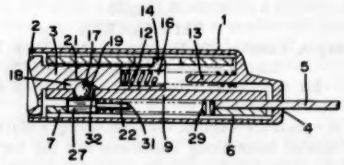
DETENT ACTION BUCKLE

Horst Minolla, Norderstedt, Germany, assignor to Klippan GmbH Hamburg, Germany

Filed Jul. 7, 1976, Ser. No. 703,381

Int. Cl.[2] A44B *11/26*

U.S. Cl. 24—230 AL **13 Claims**



1. A buckle for receiving a tongue comprising:

(a) a buckle having a first and second plate, each with a flat surface parallel to that of the other, said surfaces being spaced to accept the forward part of the tongue between them, said forward part of the tongue and said first plate each having an opening therethrough, which openings substantially coincide when the tongue is fully inserted between the surfaces, thereby forming a chamber;

(b) a detent disposed within the chamber formed by the first plate and the tongue when the latter is fully inserted;

(c) a tongue release member having a slideable surface in contact with the upper surface of the first plate, said slideable surface of the tongue release member having an elongated cavity which is longer than the opening in the first plate, said tongue release member limited in its slideable motion from a first position where a forepart of the elongated cavity substantially coincides with the opening in the first plate, and a second position wherein the rear part of the elongated cavity substantially coincides with the opening in the first plate, said forepart of the elongated cavity having a depth such that taken together with the opening in the first plate, the detent can be completely contained in the space formed thereby, without extending beyond the exposed surface of the first plate, and the rear part of the elongated cavity having a depth less than that of the forepart, such that when taken together with the opening in the first plate, the detent cannot be completely contained in the space formed thereby, but extends beyond the exposed surface of the first plate; and

(d) an outwardly biased tongue ejecting member, slideably positioned between the first and second plate in the path of the inserted tongue, said ejecting member limited in its forward movement in response to its bias, to a position to block the opening in the first plate, thereby retaining the detent in the closed space produced by the forepart of the cavity of the tongue ejecting member together with the opening in the first plate; whereby the inserted tongue displaces the tongue ejector allowing the detent to enter said chamber formed by the coincidence of the opening in the first plate with that of the inserted tongue, thus latching the tongue when the tongue release member is moved to its second position, but resulting in the ejection of the tongue when the tongue release member is moved to its first position.

4,100,658

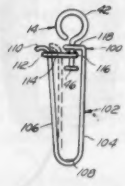
FISHING LURE-AND-LINE SNAP SWIVEL

John P. Nikota, 876 Riverdale, Windsor, Canada (N8S 4C1)

Continuation-in-part of Ser. No. 708,308, Jul. 26, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 774,600

Int. Cl.[2] A44B *13/02*

U.S. Cl. 24—231 **10 Claims**



1. A fishing lure-and-line snap swivel, comprising

a fishing line connector having thereon a shank with a line attachment portion and a retaining abutment fixedly mounted on said shank and disposed in spaced relationship to said line attachment portion,

and a one-piece bent wire fishing lure connector including a bearing loop portion disposed on said shank between said line attachment portion and said retaining abutment and relatively rotatably receiving said shank and also including a reversely-bent lure attachment portion extending from one end of said bearing loop portion and a closure portion extending from the other end of said bearing loop

portion across the open end of said lure attachment portion,

said lure attachment portion and said closure portion having releasable latch and keeper portions respectively disposed upon the outer ends thereof in proximity to one another and to said bearing loop portion and movable into and out of interlocking engagement with one another.

4,100,659
PROCESS FOR TEXTURIZING FILAMENTS

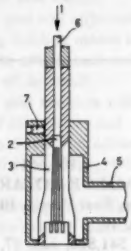
Wolfgang Bauer, Heidelberg; Wolfgang Martin, Ludwigshafen, and Erwin Lehrer, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 555,632, Mar. 5, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,237

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1974, 2410429

Int. Cl.[2] D02G *1/12, 1/16, 1/20*

U.S. Cl. 28—255 **4 Claims**



1. In a process for crimping filaments wherein the filaments are passed through two zones of a treatment chamber by means of a heated carrier gas and wherein carrier gas is removed radially from the second zone of the treatment chamber, the improvement which comprises: adjusting the amount of gas radially drawn off from said second zone whereby substantially no air motion is present at the exit end of the second zone except that resulting from the passage of the crimped filaments, the bulk of said carrier air being removed from substantially the first 75 percent of the total length of the second zone, said filaments being compressed and crimped within said second zone.

4,100,660
APPARATUS FOR THE HEAT TREATMENT OF RUNNING THREADS BY MEANS OF SATURATED STEAM

Franz Nemecek, Dusseldorf; Edgar Muschelknautz, Leverkusen; Wolfgang Lindner, Dormagen, and Herbert Preiss, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

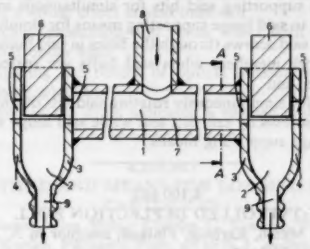
Filed Sep. 12, 1977, Ser. No. 832,756

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643787

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—271 **9 Claims**

1. An apparatus for the heat treatment of running threads, comprising a heating chamber having openings in the walls thereof through which, in use, the thread travels, shutter



means for varying the area of the said openings, and means for supplying saturated steam to the heating chamber.

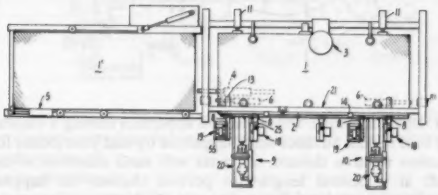
4,100,661
DOOR HINGE APPLYING APPARATUS

Edward G. Cheak, Chico, Calif., assignor to Norfield Manufacturing Co.,, Chico, Calif.

Division of Ser. No. 520,200, Nov. 4, 1974, Pat. No. 3,979,817. This application May 19, 1976, Ser. No. 687,787

Int. Cl.[2] B27F *5/12;* **B27M** *1/08*

U.S. Cl. 29—33 K **8 Claims**



1. An apparatus for hingedly connecting an adjacent pair of work members each having elongate butt-receiving surfaces, by conventional hingedly connected butt hinges each having butts to be seated in mortises of outlines corresponding to the outlines of the butts, and each butt having a plurality of screw holes in a predetermined pattern for screws to secure said butts in said mortises;

(a) means for supporting said work members and means connected to said work member supporting means for holding said butt-receiving surfaces having said mortises therein spaced apart in the same vertical plane and facing in the same direction for receiving the butts of said butt hinge in said mortises;

(b) a screwdriver unit, and means connected to said work member supporting means for supporting said unit for movement to and from said mortises when said work members are supported in said positions, and unit-moving means connected with said unit for so moving it;

(c) hinge supporting means movably mounted on said unit, said hinge supporting means including resilient means biasing said hinge supporting means in advance of said screwdriver unit prior to its engagement with the butt-receiving surfaces, said hinge supporting means releasably supporting said hinge thereon for movement therewith to said mortises and for firmly seating the butts of said hinge in said mortises with one butt in the mortise in one work member and the other in the mortise in the other work member and for holding said butts in said mortises until the butts are screwed to the work members;

(d) a plurality of screwdriver bits rotatably supported on said unit for movement therewith each in alignment with one of the holes in said butts when said butts are seated in

said mortises and means for releasably holding a screw on each bit in said alignment with one of the holes in said butts;

(e) means supporting said bits for simultaneous movement relative to said hinge supporting means for simultaneously driving said screws through the holes in said butts and into said work members when said butts are seated in said mortises; and

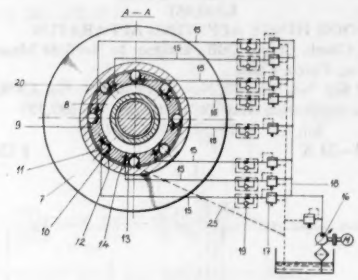
(f) means for simultaneously rotating said bits during driving of said screws by said bits and while said hinge is held by said hinge supporting means.

4,100,662

CONTROLLED DEFLECTION ROLL

Pertti Lauri Metso, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed Dec. 27, 1976, Ser. No. 754,520
Claims priority, application Finland, Jan. 21, 1975, 750135
Int. Cl.[2] B21B *13/02*
U.S. Cl. 29—110 **10 Claims**



1. In a controlled deflection roll apparatus having a stationary base means, an inner shaft supported by said base means for rotation relative thereto, an outer roll shell attached to the shaft at a central lengthwise portion thereof for support thereby and rotation therewith, and fluid pressure operated jack means operable to exert supporting forces on the roll shell at the ends thereof to control the deflection of the roll shell by load forces acting thereon, the improvement which comprises: a bearing having a stationary part and having a rotary part connected to said roll shell for rotation therewith, and said jack means having a plurality of reaction elements aligned along respective radial paths and responsive to the influence of fluid pressure to generate forces directed along said respective paths and applied to the stationary part of said bearing and transmitted through the rotary part thereof to the roll shell to control the deflection thereof by said load forces, said radial paths being generally statinary with respect to said base means, said jack means having fluid flow paths to said reaction elements accommodating the adjustment of the fluid pressure influencing respective reaction elements for corresponding adjustment of said generated forces.

4,100,663

CARBURETOR, KIT AND TOOL FOR USE THEREIN

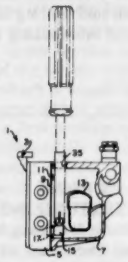
James R. Crum, P. O. Box 1271, St. Charles, Mo. 63301

Filed Apr. 29, 1977, Ser. No. 792,216
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—156.4 R **8 Claims**

1. A method of simplifying changing the jets of a carburetor of the type including a carburetor body, a metering block on the side of the carburetor body, a pair of jets threaded into the exterior of the metering block, and a float chamber defined in part by said metering block and in part by a float bowl, said method comprising, in a desired order, the steps of:

replacing said jets with adapters, each adapter including an L-shaped passage, one end of said passage communicating with the metering block and the other end forming an upwardly facing threaded bore for threaded replacement jets,

providing access opening means in an upper wall of said float bowl for removing said replacement jets from said



adapters and replacing said replacement jets in said adapters without removing said float bowl from said metering block, and

assembling said replacement jets within said upwardly facing threaded bores of said adapters.

4,100,664

APEX SEAL FOR ROTARY ENGINES

Chris Robert Straesser, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 541,810, Jan. 17, 1975, abandoned. This application Sep. 22, 1975, Ser. No. 615,779
Int. Cl.[2] B23P *15/06*
U.S. Cl. 29—156.6 **1 Claim**

1. The method of forming a seal for rotary engines having different coefficients of thermal expansion at opposite edges comprising the steps of:

(a) providing a mold having a shape corresponding approximately to the desired shape of the seal to be formed;

(b) introducing in to the mold a layer of sinterable material having a first coefficient of thermal expansion;

(c) thereafter introducing into the mold a strip of low-ash paper;

(d) repeating, seriatim, steps (b) and (c) using materials, each having different coefficients of thermal expansion until the desired number of layers, each separated by a strip of low-ash paper have been received in the mold;

(e) compacting the materials in the mold;

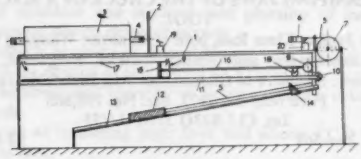
(f) sintering the materials; and

(g) thereafter finish machining the seal to a desired final configuration with the layers of different coefficients of thermal expansion providing a different coefficient of thermal expansion from top to bottom of the seal.

4,100,665
MACHINE FOR SEPARATING ROLLS OF CLOTH FROM THE SHAFTS ON WHICH THEY ARE ROLLED

Jean Rourat, Chemin de la Fouillouse, Riorges (Loire), and Marcel Rourat, 65 Rue Lucien Sampaix, Roanne (Loire), both of France

Filed Aug. 12, 1976, Ser. No. 713,959
Claims priority, application France, Aug. 12, 1975, 75 25592
Int. Cl.² B23P *19/04*
U.S. Cl. 29—252 **15 Claims**

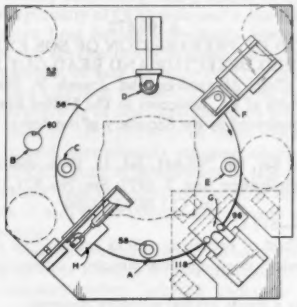


1. A machine for extracting a shaft from a roll of woven or knitted textile cloth, wherein said shaft has at least one end projecting from the cloth rolled thereon, said machine comprising:
- a fixed frame;
- stop means mounted to said frame;
- means for positioning said roll adjacent said stop;
- a traction cable having holding means at one end, said holding means adapted to attach said one end of the cable to said projecting end of the shaft;
- means for tensioning said traction cable attachable to the opposite free end of said cable; and
- means for actuating said traction cable interposed said one end and said means for tensioning, whereby when said roll is positioned against said stop and said holding means is attached to said projecting end of the shaft, said actuating means is operative to extract said shaft from said roll of cloth.

4,100,666
ASSEMBLY METHOD

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Chagrin Falls, Ohio

Filed May 2, 1977, Ser. No. 792,933
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—407 **9 Claims**



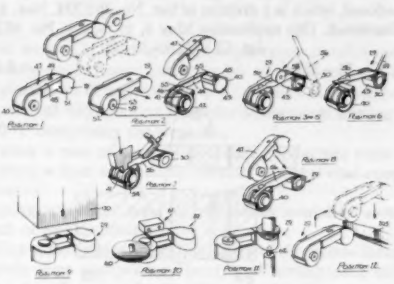
1. A method of assembly of a strain indicator comprising the steps of:
- (a) providing a tensile element;
- (b) providing an indicator, said indicator having means to produce a visual effect which is a function of the strain on said tensile element;
- (c) inserting said indicator at least partially into said tensile element;
- (d) exerting a tensile pull on said tensile element so as to create a visual effect at said indicator;
- (e) optically measuring said visual effect with said tensile member under load;
- (f) comparing the results of optical measurement with a standard; whereby,

the quality of the strain indicator is verified under load.

4,100,667
METHOD AND MEANS FOR LOADING FILM CARTRIDGES

Carl A. Napor, Glen Ridge; Charles G. Krumm, Wyckoff, and Joseph Kucich, Palisades Park, all of N.J., assignors to Kahle Engineering Co., Union City, N.J.

Filed May 18, 1976, Ser. No. 687,638
Int. Cl.² B23P *21/00*
U.S. Cl. 29—429 **36 Claims**



1. An improved cartridge loading means for inserting film scrolls into cartridges having removable covers comprising the combination of:
- a loading head;
- a movable support for presenting said head to a plurality of loading positions;
- means for driving said support;
- a nest having a cartridge receiving means thereon and being movably mounted on said loading head;
- means for moving said nest from a first attitude with the cartridge cover positioned upwardly to a second attitude on said loading head with the cartridge side walls positioned upwardly;
- means for removing and for reapplying covers from a cartridge in said nest and for inserting the film scrolls when said nest is in its first attitude; and
- means for sealing the cartridge covers to the cartridges when said nest is in said second attitude.

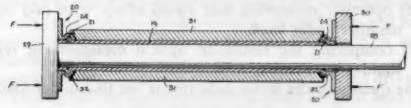
4,100,668
METHOD OF MAKING A RUNG ASSEMBLY FOR A LADDER

George Robert Ruff, Newberry, and Danny O'Brian Derrick, Columbia, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Division of Ser. No. 591,957, Jun. 30, 1975, abandoned. This application Jul. 14, 1976, Ser. No. 705,163
Int. Cl.² B21D *39/00*; B23P *11/02*
U.S. Cl. 29—523 **2 Claims**

1. A method of making a rung assembly for a ladder comprising
- supporting a rung having a pair of hollow ends throughout the inside of each said end and partially on the outside of each said end;
- mounting a flanged fitting having an annular collar and a radially directed flange over each said end of said rung; and

compressing said ends of said rung longitudinally to swage each respective rung end and said annular collar of a fitting simultaneously to form outwardly directed inter-



locking peripheral beads thereon located in the unsupported outside of said rung and collar adjacent said ends of said rung.

4,100,669

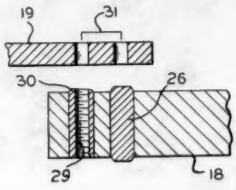
CASTING PROCESS

Steven J. Pemper, 1638 W. Pierce St., Milwaukee, Wis. 53204

Continuation-in-part of Ser. No. 554,559, Mar. 3, 1975, abandoned, which is a division of Ser. No. 302,731, Nov. 1, 1972, abandoned. This application May 4, 1976, Ser. No. 682,991

Int. Cl.[2] B22D *19/00*

U.S. Cl. 29—527.6 **5 Claims**



1. A process for producing castings, comprising the steps of forming a mold to the shape and dimensions of a casting, forming a depression in the interior surface of said mold, positioning an end portion of a insert of a machinable metallic meterial in said depression, casting a second metallic material having a substantially greater hardness than said first metallic material in said mold and substantially surrounding said insert, cooling said casting, removing said mold with said end portion of the insert projecting beyond the casting, machining the projecting end portion of the insert, and thereafter hardending the machined end portion of the insert.

4,100,670

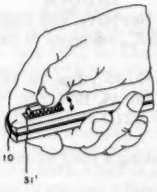
IC INSERTION TOOL

Marvin Kober, Spring Valley, N.Y., and Jarda Dvorak, Ringwood, N.J., assignors to OK Machine & Tool Corp., New York, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,270

Int. Cl.[2] H05K *3/32*

U.S. Cl. 29—564.1 **8 Claims**



1. An insertion tool comprising a handle portion having an electrical component gripping end, said gripping end comprising means for gripping the sides of the electrical component and forming a cavity for receiving the gripped electrical component and for restraining rearward movement of the gripped component, and means for biasing the gripping means into a forwardly-projecting position, said gripping means being retractable within the handle when pressure is applied overcoming the biasing means, whereby retraction of the gripping means causes ejection of the electrical component from its receiving cavity.

4,100,671

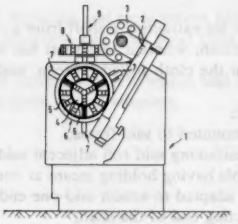
ARRANGEMENT FOR AUTOMATICALLY CHANGING THE CLAMPING JAWS OF THE CHUCK OF A MACHINE TOOL

Wilhelm Junike; Klaus Rall, both of Hanover; Wolfgang Schaefer, Langenhagen, and Günther Twiefel, Burgwedel, all of Germany, assignors to Gildemeister AG, Bielefeld, Germany

Filed May 19, 1977, Ser. No. 798,605

Int. Cl.[2] B23Q *3/00, 3/155*

U.S. Cl. 29—568 **23 Claims**



1. A device for automatically changing clamping jaws of a rotatable chuck of a machine tool comprising:

a plurality of clamping jaws for engaging a workpiece;

a clamping jaw magazine having guide means carrying the clamping jaws;

a chuck having guide means adapted to receive the clamping jaws;

means for aligning said guide means adapted to receive the clamping jaws with said guide means carrying said clamping jaws; and

means for transferring at least one clamping jaw between the magazine and the chuck when said guide means adapted to receive the clamping jaws is aligned with said guide means carrying the clamping jaws.

4,100,672

METHOD OF PREPARATION OF SOS EXTRINSIC INFRARED DETECTOR AND READ-OUT DEVICE

Gerard J. King, Alexandria, and Joseph F. Martino, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 705,641, Jul. 15, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,370

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—577 C **6 Claims**

1. A method of preparing a SOS extrinsic IR detector and readout device on an epitaxial structure comprising the steps of:

providing a single crystal sapphire substrate;

epitaxially depositing a layer of single crystal silicon on one side of said sapphire substrate;

masking said layer of single crystal silicon with etch masks to delineate a plurality of detector islands and a CCD signal readout structure;

non-slective chemically etching through said layer of single crystal silicon down to said sapphire substrate to delineate a plurality of individual intrinsic silicon detector islands

and a silicon CCD signal readout structure in proximity thereto on one side of said sapphire substrate;

unmasking said layer of single crystal silicon as delineated in step three;

covering said silicon CCD signal readout structure with a protective mask and doping said plurality of individual intrinsic silicon detector islands with slow or rapid diffusant dopant materials into a plurality of individual extrinsic silicon detectors possessing a desired infrared wavelength region wherein said slow or rapid diffusant dopant materials are kept out of said silicon CCD readout structure;

removing said protective mask from said silicon CCD readout structure and masking said plurality of individual extrinsic silicon detector islands;

diffusing a plurality of slow diffusant type input diffusions into the portion of said silicon CCD readout structure that is adjacent said plurality of extrinsic silicon detector islands;

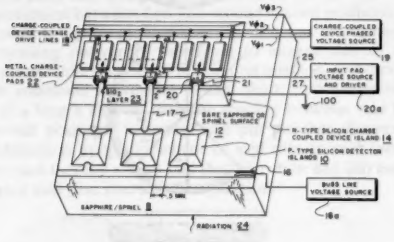
growing an insulating layer over said silicon CCD readout structure;

photolithographically etching away the portion of said insulation layer that is directly over said plurality of slow diffusant type input diffusions;

cleaning said substrate surfaces;

evaporating a metallized layer over the silicon device side of said substrate;

photolithographically etching away said metallized layer to leave the following conductive structures thereon, a lead



from said silicon CCD readout structure to an electrical ground; a buss line common to the inputs of all of said plurality of extrinsic silicon detectors; a plurality of detector output leads connected between an output side of said plurality of extrinsic silicon detectors and said plurality of input diffusions; a plurality of input structure pads and a lead electrically connecting said plurality of input structure pads; a plurality of CCD pads; and a plurality of CCD voltage drive lines having individually electrically isolated lines that are electrically connected to intermittently repated numbers of said plurality of CCD pads of said plurality of CCD pads in some preselected phasing and whrein said plurality of input structure pads are positioned between each of said plurality of input diffusions and adjacent to said intermittently repeated numbers of said plurality of CCD pads in which each of said plurality of input structure pads is positioned opposite the common connection of said CCD voltage drive line in said preselected phasing;

providing a buss line voltage source to said buss line for providing flow of carriers in said plurality of extrinsic silicon detectors when infrared radiation impinges thereon;

providing an input pad voltage source and driver to said common metallic lead electrically connecting said input structure pads; and

providing a CCD phased voltage source having phased voltages connected to individual lines of said plurality of CCD voltage drive lines to provide CCD signal readout of signals generated in said plurality of extrinsic silicon detectors by infrared radiation impinging thereon in which said input pad voltage source and driver sequentially switches a voltage to all of said plurality of extrinsic silicon detectors and inject these readout signals in the layer of said silicon CCD signal readout structure that is immediately below said plurality of metal CCD pads.

4,100,673

METHOD OF MAKING HIGH TEMPERATURE PARALLEL RESISTANCE PIPE HEATER

Joseph E. Leavines, P.O. Box 310, 2 Sierra Cir., New Braunfels, Tex. 78130

Division of Ser. No. 683,299, May 5, 1977, Pat. No. 4,037,083. This application Jul. 7, 1977, Ser. No. 813,445

Int. Cl.[2] H05B *3/00*

U.S. Cl. 29—611 **2 Claims**

1. The method of making a high-temperature parallel-resistance sheathed pipe heater cable capable of being operated at a temperature level of approximately 600° F on a sustained basis and capable of withstanding temporary occasional heating up to 1,000° F comprising the steps of

providing a pair of flexible electrical conductors each including at least nineteen fine strands of nickel-clad copper wire,

wrapping a primary layer of micaceous insulation around each of said conductors,

braiding a secondary insulation layer of fiberglass threads tightly over said primary layer, said threads each being coated with an anti-fraying agent,

stripping short sections of both primary and secondary insulation layers from said conductors at uniformly spaced intervals to expose bared segments of the conductors, each of said bared segments having the same predetermined length and being spaced from its neighbors by an interval of the same predetermined length,

positioning said pair of stripped insulated conductors side-by-side with the bared segments of one being located mid-way between the bared segments of the other,

twisting said pair of conductors together to form a twisted pair for holding the two conductors in position with the bared segments of one conductor alternating in occurrence with the bared segments of the other conductor along the twisted pair,

helically wrapping a nickel-alloy resistance wire around said twisted pair of conductors with at least two bights of the resistance wire engaging each of said bared conductor segments for providing a multiplicity of contact points of high unit area pressure where each of said bights of the nickel-alloy resistance wire presses against the nickel-clad surfaces of the fine copper strands,

wrapping another layer of micaceous insulation over said helically-wound resistance wire,

braiding an outer jacket of fiberglass threads tightly over said latter micaceous insulation layer to form a jacketed heater cable assembly, and

inserting said assembly into a stainless steel tube to form the sheathed heater cable.

4,100,674

METHOD FOR MAKING A SIDE TERMINAL WELD

Ralph G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Filed Feb. 2, 1977, Ser. No. 764,833

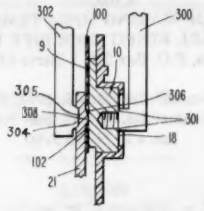
Int. Cl.[2] H01M *2/22*

U.S. Cl. 29—623.5 **2 Claims**

1. A method for connecting battery terminals to battery lugs

in a battery, said battery having a case having at least one terminal through a wall thereof, said battery case having at least one group of battery plates within a cell, said group having at least one strap having a portion of a lug disposed adjacent and overlapping at least a portion of an interior surface of said terminal, said method comprising:

(a) providing insulating material with an aperture defined



therein, between a portion of said overlapping lug surface and said adjacent interior terminal surface;

(b) pressing a portion of said overlapping portion of said lug to extrude said portion of said lug through said aperture to contact said terminal; and

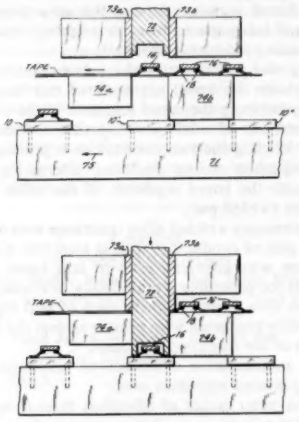
(c) resistance welding at least that portion of said lug to said terminal which contacts said terminal to form an integral connector between said terminal and said lug.

4,100,675

NOVEL METHOD AND APPARATUS FOR HERMETIC ENCAPSULATION FOR INTEGRATED CIRCUITS AND THE LIKE

David Thomas Landsittel, New Providence, N.J., assignor to Mansol Ceramics Company, Belleville, N.J.

Filed Nov. 1, 1976, Ser. No. 737,286
Int. Cl.[2] H05K *3/28*
U.S. Cl. 29—627 **13 Claims**



1. A package assembly for hermetically sealing semi-conductor type chips and the like, comprising:

a base member formed of an insulating material and having a chip mounting surface formed on one side thereof;

at least one row of openings formed in said base member, one end of each of said openings terminating at said mounting surface;

a plurality of conductive pins extending through said opening, one end of each of said pins defining a lead mounting surface, a major portion of said one end of each of said pins being planar and substantially flush with said mounting surface;

said base member including means for forming a hermetic seal between each of said pins and their associated pin openings;

a lid formed of an insulating material having a mating surface abutting said mounting surface, said mating surface of said lid overlying said one end of said pins and including a recess formed therein, said recess defining a hollow interior volume adapted to receive a semi-conductor chip or the like; and

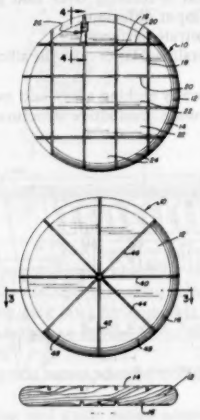
sealing means located between said mating surface of said lid and said mounting surface of said base member for hermetically isolating each of said pin seals from each other and from said recess.

4,100,676

PIZZA CUTTING BOARD

Robert H. Ferguson, 311 S. Windsor Dr., Arlington Heights, Ill. 60004

Filed Apr. 20, 1977, Ser. No. 789,210
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—292 **2 Claims**



1. In a pizza cutting device comprising a base having a pair of oppositely facing flat surfaces and a plurality of slots formed in each one of said flat surfaces, said slots formed in one of said surfaces pass through a common point located substantially at the midportion of said one surface and some of said slots in the other of said surfaces lie parallel to each other and the remaining slots in said other of said surfaces lie parallel to each other and are perpendicular to and intersect the first-named some of said slots, and hand-drawn cutting means having a cutting edge for cutting said pizza in the pattern established by said slots by drawing said cutting means across said base such that a pizza resting on said surface can be cut by the cutting edge of the cutting means, and said slots in both surfaces are of a width and a depth to coact with said cutting edge of the cutting means to produce a clean and complete cut through the pizza resting on said base.

4,100,677

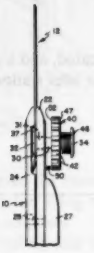
PRECISION CUTTING TOOL

Adolph L. Jeff, 155 Park La., Rochester, N.Y. 14625

Filed Feb. 15, 1977, Ser. No. 768,726
Int. Cl.[2] B26B *1/00*
U.S. Cl. 30—321 **3 Claims**

1. A precision cutting instrument of the type adapted for use by graphic artists, said cutting instrument comprising: an elongated handle having a longitudinal axis extending along the length thereof; a planar cutting blade having a cutting edge and a tang portion spaced therefrom; and clamping means mounted

on one end of said handle for detachably clamping the tang portion of the blade to said one end of the handle to position said blade in one of a plurality of predetermined angular positions relative to said axis, said clamping means comprising: (a) a shaft for supporting said blade on said one end of the handle; (b) means for rotatably mounting said shaft on said one end of the handle; (c) means for keying said blade to said shaft so as to rotate therewith, whereby the angular position of said blade relative to said axis is governed by the angular position of said shaft; and (d) locking means for selectively preventing rotational movement of said shaft in at least one direction while said blade is positioned in one of said plurality off predetermined angular positions, said locking means comprising: (i) a



disc-member having a plurality of spaced indentations formed in the periphery thereof, said disc being journalled to rotate with said shaft and being slidably mounted on said shaft for axial movement between first and second spaced positions; (ii) a pin member rigidly mounted on said one end of the handle and extending outwardly therefrom to engage one of said indentations while said disc is in said first position, and thereby prevent rotational movement of said shaft, said pin member being of a length shorter than the spacing between said first and second positions, whereby said pin member disengages said indentation upon movement of said disc to said second position, and thereby allows said shaft to rotate; and (iii) means for urging said disc into said first position.

4,100,678

METAL BRACKET FOR USE IN ORTHODONTIC TREATMENT

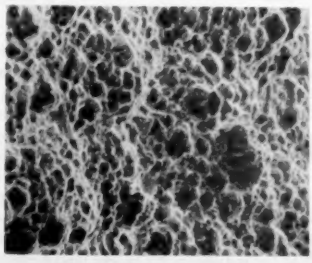
Kenichi Yatabe, 1-5, 4-Chome Shimo Meguro, Meguro-Ku, Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,486

Claims priority, application Japan, Oct. 20, 1975, 50-142657[U]

Int. Cl.[2] A61C *7/00*

U.S. Cl. 32—14 A **4 Claims**



1. A metal bracket for use in orthodontic treatment which comprises a bracket body for receiving and securing a wire which transmits orthodontic force to the tooth and a support base for supporting said bracket body and which is adhered to the tooth, a plurality of fine pores in the form of undercut pores being formed in the support base by blowing fine particles of solids entrained in a pressurized fluid against the support base and then immersing the resulting scarred base in an oxidizing solution.

4,100,679

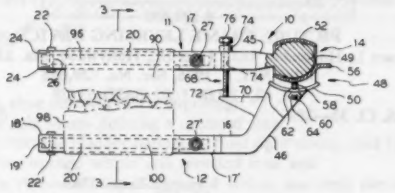
DENTAL ARTICULATOR

Israel Mogilevsky, 3909 N. 51st Blvd., Milwaukee, Wis. 53216

Filed Aug. 9, 1976, Ser. No. 712,496

Int. Cl.[2] A61C *11/00*

U.S. Cl. 32—32 **10 Claims**



1. An articulator for dental models including upper and lower clamp portions, first pivot means interconnecting said clamp portions, each of said upper and lower clamp portions including a frame portion and a pair of elongated clip members extending generally away from said first pivot means and each having a remote end and a relatively proximate end with respect to said first pivot means, first resilient means connecting the remote end of one clip member of each pair to the remote end of the other clip member thereof for urging one clip member of each pair of clip members toward the other, the remote end of the other clip member of each pair being pivotally mounted by second and third pivot means on its associated frame portion and at the end thereof remote from said first pivot means and additional resilient means associated with each clamp portion for urging the proximate ends of said clip members inwardly, whereby a dental model may be resiliently clamped between said clip members.

4,100,680

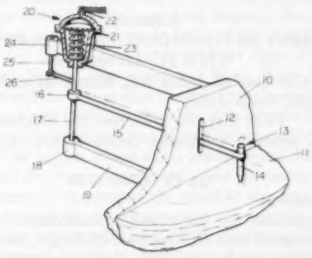
SENSING THE LEVEL OF MOLTEN GLASS IN A TANK

Robert R. Rough, Sr., Toledo, and Homer D. F. Peters, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toldeo, Ohio

Filed May 2, 1977, Ser. No. 792,758

Int. Cl.[2] G01B *5/18;* **G01F** *23/04*

U.S. Cl. 33—126.7 A **2 Claims**



1. Apparatus for gauging the level of molten glass in a tank, comprising:

an electrical sensing probe;

a reversible electric motor;

operating connections between the probe and the motor for

moving the former into and out of contact with the molten glass;

a motor control connected to said motor for reversing the operation of said motor upon contact of said probe with the molten glass in said tank;

solenoid means connected to said probe, said solenoid means being carried by an arm;

means driving said arm from said motor;

means pivotally mounting said probe to said arm; and

means connecting said probe to the armature of said solenoid for rapidly moving said probe out of contact with the molten glass.

4,100,681

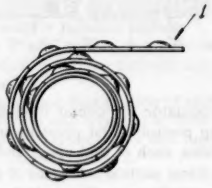
PICTURE FRAME LEVELING DEVICE

Bruce L. Hollander, 1025 Tyler St., Hollywood, Fla. 33020

Filed Nov. 8, 1976, Ser. No. 739,603

Int. Cl.[2] B32B *3/00*; B65D *65/28*

U.S. Cl. 33—389 **3 Claims**



1. A spirit level device comrising:

a. a flexible base member;

b. a flexible transparent blister member having a longitudinal cavity of blister-like shape;

c. adhesive means affixing said blister member in face-to-face engagement against one side of said base member to define therewith a closed cavity chamber;

d. a liquid filling most of said chamber;

e. a bubble filling the remainder of said chamber not filled by said liquid;

f. means on said blister member for indicating the leveling position of said bubble in said cavity chamber;

g. a coating of pressure sensitive adhesive on the outside of said base member; and

h. a protective cover strip covering said pressure-sensitive adhesive on the outside of said base member;

i. said blister member being formed with a plurality of longitudinal cavities equidistantly spaced therealong, said base member being substantially coextensive with said blister member, each of the closed cavity chambers thereby defined being filled with liquid and an air bubble.

4,100,682

TREATMENT OF COMMODITIES THROUGH CONTACT WITH FLUID MEDIA

John H. Corrigan, 62 Judith Rd., Emmarentia, Johannesburg, Transvaal, South Africa

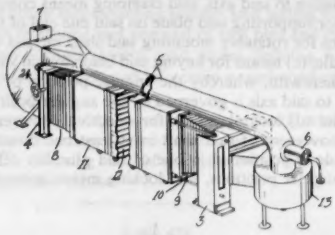
Filed Mar. 31, 1976, Ser. No. 672,316

Claims priority, application South Africa, Apr. 10, 1977, 77/1844

Int. Cl.[2] F26B *3/04*

U.S. Cl. 34—22 **12 Claims**

1. Apparatus for subjecting commodities to treatment through contact with fluid media including a plurality of movable conveyances having walls and being arranged so as to form a conveyance train which forms a part of a single endless fluid conveying duct, having walls and opposite ends, with the walls of said part of said duct formed by the walls of said conveyances, in which the treatment to which the commodities is to be subjected takes place with fluid passing progressively through the conveyances forming the conveyance train, a fluid inlet station means and a fluid outlet station means at opposite ends of the conveyance train and between which the



conveyance train is located, and a circulating duct which links the outlet station to the inlet station as a portion of the endless duct.

4,100,683

DRYING CYLINDER FOR A PAPER MAKING MACHINE

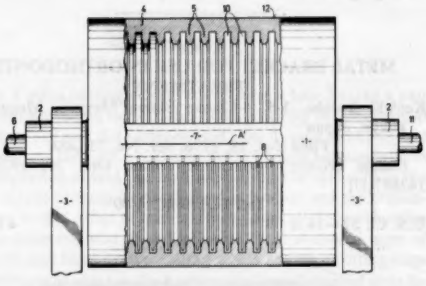
Bruno Barp, Rudolfstetten, Switzerland, and Herbert Holik, Ravensburg, Germany, assignors to Escher Wyss GmbH, Ravensburg, Germany

Filed May 5, 1976, Ser. No. 683,379

Claims priority, application Switzerland, May 12, 1975, 6030/75

Int. Cl.[2] F26B *11/02*

U.S. Cl. 34—124 **10 Claims**



1. A drying cylinder for a paper-making machine comprising a cylindrical barrel disposed on a longitudinal axis;

a plurality of annular ribs disposed peripherally within and on said barrel in spaced relation to define recesses therebetween, each said rib having an axis perpendicular to said longitudinal axis and a profile situated in a zone bounded outwardly by a hexagon symmetrical about said rib axis and consisting of a rectangle of a width equal to a rib width and a height equal to 0.75 times a rib height and an adjoining trapezium having a width of 0.65 times said rib width at the maximum rib height, and bounded inwardly by a pentagon symmetrical about said rib axis of a width of 0.7 times said rib width at the mid-height of said rib and which has a vertex at said maximum rib height; and

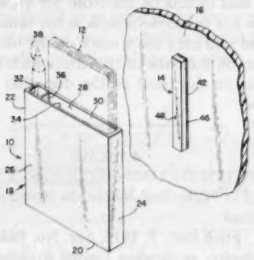
a plurality of tubes for removing condensate within said barrel, each tube extending into a respective recess between two adjacent ribs.

4,100,684

HOLDER DEVICE FOR PAPER ARTICLES AND WRITING INSTRUMENTS

Stuart Berger, 12 Overton Rd., East Windsor, N.J. 08520

Filed Jun. 21, 1976, Ser. No. 698,073
Int. Cl.[2] A47F 7/00; A47B 96/06; B43L 5/02
U.S. Cl. 35—62 7 Claims



1. A holder device adapted for receiving paper articles and writing means therein and for being removably secured to a stationary object, which comprises:

(a) an elongated bar member, said bar member including a ferrous metallic element having an adhesive layer deposited thereon, said adhesive layer adhesively adhering said metallic element to said stationary object, said bar member further including two elongated sections, and a hinge means joining said sections;

(b) a housing having at least two vertical compartments therein with an open top, one said compartment for receiving said paper articles, and other of said compartments for receiving said writing means; and

(c) means for removably securing said housing to said bar member, said removable securing means including a permanent magnet mounted on said housing, said permanent magnet removably receivable onto said metallic bar member.

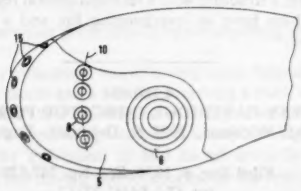
3. A device according to claim 1, wherein a blackboard element is affixed onto said housing.

4,100,685

SPORTS SHOE

Adolf Dassler, Am Bahnhof, D-8522 Herzogenaurach, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,057
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602310
Int. Cl.[2] A43B 7/06
U.S. Cl. 36—3 B 14 Claims



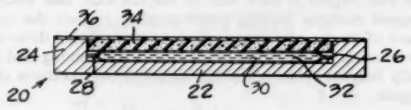
1. A sports shoe having a toe end and a flexible plastics outsole, venting channels extending through said outsole between the exterior and interior of the sole and orifices to said venting channels at the interior of the shoe, wherein said channels and orifices are arranged on an imaginary line which extends beneath the hollows of the toes of the wearer, between the ball of the foot and the balls of the toes of the wearer.

4,100,686

SHOE SOLE CONSTRUCTION

Thomas E. Sgarlato, 354 Bachman Ave., Los Gatos, Calif. 95030; Gary A. Eston, 420 Maple St., Redwood City, Calif. 94063, and Thomas E. Freeman, 100 Arch St., Redwood City, Calif. 94062

Filed Sep. 6, 1977, Ser. No. 830,690
Int. Cl.[2] A63B 21/00
U.S. Cl. 36—29 8 Claims



1. A shoe construction comprising:

(a) a sole means defining a recessed area;

(b) a flexible bladder defining a fluid tight cavity, said bladder disposed within said recessed area; and

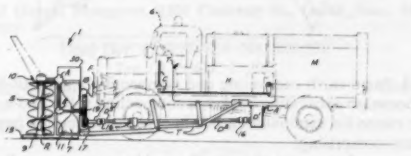
(c) a volume of liquid disposed within and only partially filling said fluid tight bladder cavity whereby liquid may freely flow from one portion of said cavity to another portion of said cavity.

4,100,687

VERTICAL AUGER SNOW REMOVAL DEVICE

Adolph Jeswine, 735 8th Ave., Helena, Mont. 59601

Filed Sep. 3, 1976, Ser. No. 720,408
Int. Cl.[2] E01H 5/00
U.S. Cl. 37—43 K 3 Claims



1. A snow removal device comprising, in combination, a snow blower fan having a horizontal axis, a first vertical auger at one side of the fan axis and in front of the fan, a second vertical auger beside the first auger, at the other side of the fan axis and in front of the fan, said first auger having a continuous right hand helix blade originating near the bottom of the auger and ending near the top of the auger, means said second auger having a continuous left-hand helix blade originating near the bottom of said second auger and ending near the top of said second auger mounting said augers for rotation about parallel vertical axes with said right hand helix auger to the right of the fan centerline, as viewed from in front of the augers and looking toward the fan, and said left hand helix auger to the left of the fan centerline, as viewed from in front of the augers and looking toward the fan, so that the front portions of the blades of the augers slope toward each other, drive means for rotating the augers in synchronism toward each other so that said front portions of the blades which slope toward each other convey snow toward the vertical plane including the fan axis, said fan having a diameter approximately equal to the height of each auger and having its axis disposed in a generally horizontal plane mid-way between the ends of the augers so that all snow conveyed toward the fan by the augers is removed by the fan without danger of clogging in the region between the fan and the augers, and further comprising, third and fourth vertical augers in a common horizontal plane with said first and second augers, means mounting said third auger beside said first auger, and means mounting said fourth auger beside said second auger, said third auger being identical to said first auger, and

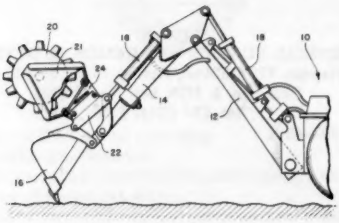
said fourth auger being identical to aid second auger, and drive means for rotating said first and third augers in the same direction and toward the fan and for rotating the second and fourth augers in the same direction and toward the fan, said drive means including positive gearing for rotating said augers at the same speed and in synchronism, said auger blades of the first and third augers being essentially tangent to each other at two locations, and said auger blades of said second and fourth augers being essentially tangent to each other at two locations, to provide inwardly sloping continuous blade surfaces across the two augers at each side of the fan axis, said essentially tangent surfaces causing snow to slide toward the vertical plane of the fan axis in a continuous fashion, said drive means for rotating the augers in synchronism maintaining said essentially tangent relationship for all rotational positions of said augers.

4,100,688

EARTH WORKING APPARATUS

Warren W. Grist, Universal City, Tex., assignor to Earth Pack, Inc., San Antonio, Tex.

Filed Aug. 19, 1976, Ser. No. 715,667
Int. Cl.[2] A01B *29/04*; B66F *9/00*; E01C *19/00*
U.S. Cl. 37—117.5 **6 Claims**



1. In an earth excavating and compacting apparatus having a boom, an excavating bucket, a compacting roller and hydraulic means for manipulating said bucket and roller, the improvement comprising:

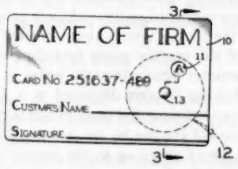
means for removably coupling said compacting roller into operative engagement with said boom including a link member connecting said bucket to said hydraulic means, means associated with said link member for receiving and engaging a mounting bracket of said bucket upon an upward movement of said boom, and means for locking said mounting bracket to said link member to secure said roller in operating position.

4,100,689

TRANSACTION CARD

Abel U. Broune, 1950 S. Ocean Dr., Hallandale, Fla. 33009

Filed Jul. 24, 1975, Ser. No. 598,889
Int. Cl.[2] G09F *3/02*
U.S. Cl. 40—2.2 **1 Claim**



1. In a transaction card (1) having permanent indicia on the front providing part of the coded designation of an authorized user, the improvement which comprises:

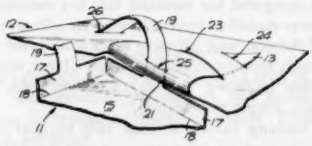
means providing a window in said card and (2) a disc rotatably mounted on the back ofthe card said disc carrying on its front face a circularly arranged series of visual indicia which registers individually in succession with said window as the disc is turned for viewing said window from the front of the card, a selected one of said indicia on the disc when visible through said window completing the coded designation of the authorized user and said disc having said indicia on the front for viewing through said window has the same indicia at the same positions on the back and said card has a mark on the back pointing to the indicium on the back of the disc which is the same as the indicium on the front of the disc that is visible at said window.

4,100,690

FOLDED COMPOSITE STRUCTURE

John Edward O'Neill, Teal House, 34 Broad St., Penryn, Cornwall, England

Filed Dec. 7, 1976, Ser. No. 748,291
Claims priority, application United Kingdom, Dec. 10, 1975, 50554/75
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—154 **9 Claims**



1. A folded structure in the form of a frame for receiving pictures, postcards and the like, comprising:

at least first and second members of foldable laminar material,

a first set of tabs projecting from the periphery of said first member,

said second member being provided with:

a first set of slots,

a second set of slots,

a third set of slots, and

a first set of tabs having slots therein, tabs of said first set of tabs of said first member passing through respective slots of said first set on said second member and through the slots of respective tabs of said first set on said second member, the tabs of said first set of said second member being rolled over and inserted through respective slots of said second set of slots of said second member, and the tabs of said first set of said first member being folded over and inserted through respective slots of said third set of slots of said second member whereby to provide a gripping effect to hold said first and second members together to form a structure with a recessed central region the sides of which have an overhanging lip, and a surrounding border.

4,100,691

SAFETY CARTRIDGE INDICATOR FOR GUNS

Michael M. Wicklund, 2902 S. Delaware, Englewood, Colo. 80110

Filed Dec. 6, 1976, Ser. No. 747,629
Int. Cl.[2] F41C *27/12*
U.S. Cl. 42—1 D **2 Claims**

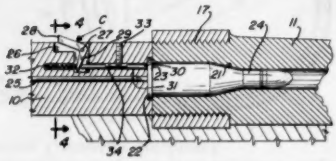
1. A chambered cartridge indicator for fire arms having a fire arm receiver including a sliding and rotatable bolt engaging a cartridge chamber and a cartridge ejection slot in the firearm receiver comprising:

(a) reciprocable cartridge contact means mounted in a bore in the bolt including means to reciprocably secure said contact means in the bore, said contact means being posi-

tioned to contact a chambered cartridge and slide in an opposite direction from such cartridge and extend into the chamber in the absence of a cartridge,

(b) pivoted striker means mounted in the bolt positioned to contact said contact means in the presence of a chambered cartridge and be pivoted thereby,

(c) slot means in said bolt communicating with said striker means and positioned so as to be within the confines of the cartridge ejection slot with the bolt in closed position and at an angle to the sight line of the fire arm,



(d) indicator means mounted in said slot means connected to said striker means and positioned to extend above the surface of the bolt and below the metal around the cartridge ejection slot when the bolt is closed and said contact means pivots said striker means, and

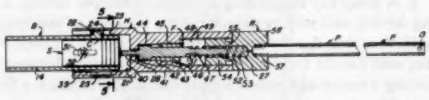
(e) spring bias means normally holding said contact emans from pivoting said striker means and normally holding said indicator means below the surface of the bolt.

4,100,692

UNDERWATER PROTECTION DEVICE

Larry D. Cameron, 16690 W. 11th Ave., Golden, Colo. 80401, and Albert W. Jacque, 1600 Balsam St., Lakewood, Colo. 80215

Filed Aug. 2, 1977, Ser. No. 821,081
Int. Cl.² F41C *27/00*
U.S. Cl. 42—1 L **10 Claims**



1. An underwater protection device comprising, in combination:

a generally cylindrical barrel having outer, laterally extending cam means and a bore for receiving a shell, with a rear rim of said shell abutting the rear end of said barrel;

a housing for receiving said barrel axially, having reception means for movement of said barrel inwardly into said housing and having interlocking means for restraining said barrel against outward movement but permitting inward movement to a predetemined extent;

said housing having means for constraining said barrel to longitudinal movement when so interlocked; and

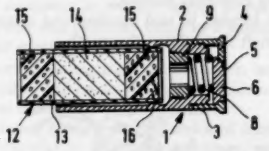
firing pin means for engaging the rear end of said shell to maintain said barrel in an outward interlocked position and for firing said shell upon impact of the outer end of said barrel with a water inhabitant, resulting in inward longitudinal movement of said barrel.

4,100,693

STRIKER CARTRIDGE

Theo Cech, Dobersbergerstr. 6, Karlstein, Thaya, Austria (3822)

Filed Feb. 1, 1977, Ser. No. 764,634
Claims priority, application Austria, Feb. 3, 1976, 736/76
Int. Cl.² F41C *27/08*
U.S. Cl. 42—1 N **12 Claims**



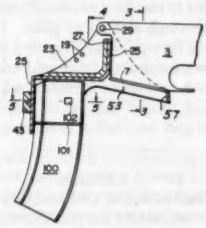
1. A striker cartridge for weapons with central firing cartridges, especially for shotguns, consisting of a jacket similar to a regular cartridge jacket and including a generally tubular side wall and a bottom wall, in whose bottom wall a circular opening is provided in the impact area of the weapon's firing pin and into which opening an impact element is inserted from the inside of the jacket and biased by a resilient spring oppositely to the impact direction of the firing pin, the improvement consisting in that the opening (5) for receiving the impact element (6) is arranged eccentrically to the jacket's longitudinal axis, and the impact element is rotatably mounted in this opening.

4,100,694

READY MAGAZINE HOLDER

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Oct. 5, 1977, Ser. No. 839,596
Int. Cl.² F41C *27/00*
U.S. Cl. 42—90 **9 Claims**



1. A ready magazine holder comprising: a frame adapted for mounting on a firearm; support means on said frame adapted for supporting a magazine in a correct orientation for insertion into a magazine receptacle on said firearm; guide means on said frame positionally adapted for directing translational movement of said magazine from said support means toward said receptacle; and stop means on said frame positionally adapted for terminating said movement with said magazine aligned with said receptacle.

4,100,695

FISHING ROD JIGGING APPARATUS

James A. Blanchard, 55 Woodbury St., Keene, N.H. 03431

Filed Dec. 15, 1976, Ser. No. 750,765
Int. Cl.² A01K *97/10*
U.S. Cl. 43—19.2 **1 Claim**

1. An apparatus for controlling the motion of a fishing rod, comprising:

a housing having a top, a bottom and enclosing sides;

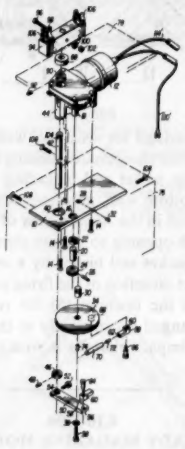
a mounting plate located in said housing between said top and said bottom;

a motor mounted on one side of and supported by said mounting plate;

a drive gear mounted on the opposite side of said mounting plate and directly connected by a drive shaft to said motor for rotation thereby;

an output shaft mounted for rotation in said housing and extending exteriorly thereof;

a first link located in said housing and connected to said output shaft for rotation therewith;



means for supporting a fishing rod exteriorly of said housing, said means being attached to said output shaft for rotation therewith;

a second link located in said housing and pivotally connected through respective first and second pivot members to said driven gear and said first link, whereby said output shaft is caused to oscillate as said driven gear is rotated by said motor through said drive gear.

said second link formed with threaded end portions, and a pair of screws extending from said end portions into engagement with said pivot members allowing the effective length of said second link to be adjusted, whereby the amplitude of said oscillation is correspondingly varied.

4,100,696

TRANSFER MECHANISM INTENDED FOR USE WITH MOVABLE FIGURINES

Toyotsugu Ogasawara, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 759,648
Int. Cl.[2] A63H *18/14*
U.S. Cl. 46—40 **8 Claims**

1. A transfer mechanism for use in transferring articles from one location to another location which includes:

a support structure provided with transfer platforms which are spaced from one another,

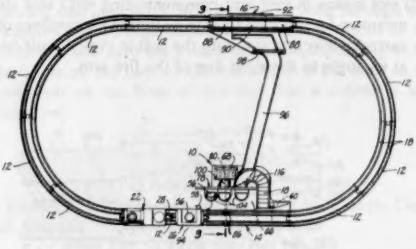
a wheel having front and back sides located vertically so that said back side of said wheel is located adjacent to said platforms,

means rotatably mounting said wheel for rotation relative to said support structure about a horizontal axis,

said wheel having at least one opening extending between said front and back sides of a shape approximating the shape of an article to be transferred using said transfer mechanism and sufficiently large so that such an article may be moved through said opening,

a carrier pivotally mounted on the front side of said wheel adjacent to said opening, said carrier having an entrance adjacent to said front side of said wheel of a shape and dimension corresponding to that of said opening,

said carrier being sufficiently heavy so as to pivot relative to said wheel by the action of gravity during the rotation of said wheel,



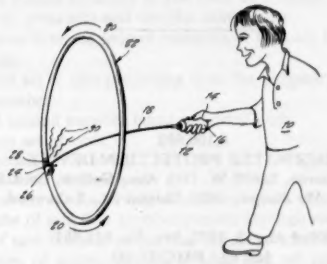
said carrier being located on said wheel in a position in which said wheel closes off said entrance to said carrier when said wheel and said carrier are in positions other than adjacent to said platform.

4,100,697

HOOP TOY

Daniel Ward, 541 Vanessa Crescent, Mississauga, Ontario, Canada (L5H 2N4)

Filed Aug. 24, 1976, Ser. No. 717,023
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—269 **6 Claims**



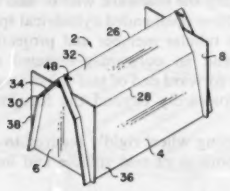
1. A hoop toy comprising a length of hollow tubing, a joining device, said joining device having the ends of said length of hollow tubing fixedly secured thereto forming a hoop, a handle, said handle forming a housing, a shaft, said housing containing a motor and power supply means therewithin, a flexible wire-like element, one end of said wire-like element removably secured to said joining device, the other end of said wire-like element removably secured to said shaft, said shaft passing through an opening in said housing, said shaft being rotated by said motor when said motor is being energized by said power supply means, tone generating means for generating an audible tone upon the rotation of said hoop about a line, said line passing through a plane engaging the outermost surface of said hoop, wherein said tone generating means includes a compartment, said compartment being disposed within said joining device, a pair of orifices being disposed in the walls of said joining device and fluidly communicating to said compartment, a plate, said plate being fixedly secured to the surface of said joining device adjacent one of said pair of orifices, the other of said pair of orifices creating a whistling tone upon the ingress of moving air through said one of said pair of orifices and the egress of said moving air through said other of said pair of orifices.

4,100,698

PORTABLE GREENHOUSE

Christopher Fries, 61 Cromary Way, Inverness, Calif. 94937

Filed Sep. 17, 1976, Ser. No. 724,253
Int. Cl.[2] A01G *13/04*
U.S. Cl. 47—29 14 Claims



1. A portable greenhouse comprising

a light-transmitting roof section comprising a roof panel of synthetic resin having opposed end edges and opposed lateral edges with at least one fold line extending between said end edges and disposed between said lateral edges, said roof panel being folded along said fold line to form said roof section having open ends, and

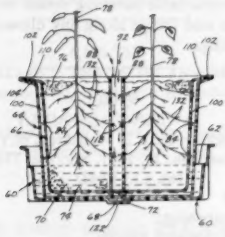
a pair of end panels, one each removably attached to said roof section adjacent each said end edge thereof to at least partially close the ends of said greenhouse, portions of each said end panel being slotted to straddle portions of the adjacent said roof section.

4,100,699

AERATED CONTINUOUSLY WATERED PLANT AND SEED ORGANIC GROWING MEDIUM AND CONTAINER FOR SAME

William Skaife, Dubuque, Iowa, assignor to Margaret R. Skaife, Trustee, Dubuque, Iowa

Continuation-in-part of Ser. No. 693,637, Jun. 7, 1976, abandoned, which is a continuation of Ser. No. 577,863, May 15, 1973, Pat. No. 3,961,444. This application Jul. 12, 1976, Ser. No. 704,190
Int. Cl.[2] A01G *25/00*
U.S. Cl. 47—81 6 Claims



1. A continuously aerated and watered seed or plant growing medium and container comprising,

a first container having a wall,

a growing medium in said first container sufficiently porous to allow air to freely circulate therethrough and having properties allowing capillary action to transmit water throughout the growing medium,

a water supply in continuous contact with said growing medium to substantially wet said growing medium and maintain it in a substantially wetted condition throughout,

an air source in continuous communication with said growing medium to provide a substantially continuous supply of air throughout said growing medium with said air having been humidified by passing through said wetted growing medium and thereby being adapted to provide humidified air to seed or plant roots in the growing medium,

said first container including sidewalls in contact with the sides of said growing medium,

an enclosure being provided in which said first container is positioned and said enclosure being larger than said first container to provide a chamber along at least a portion of said first container to provide humid air to said growing medium, and said chamber being in communication with said water supply,

said enclosure including a second container, larger than said first container and having coextensive sidewalls in spaced relation to define said chamber, and

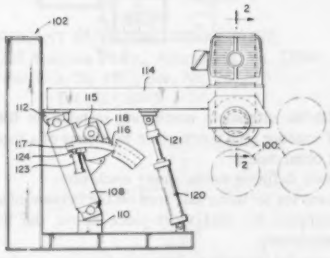
a third container being provided and said second container being positioned in said third container, said third container being sufficiently larger than said second container to provide a second chamber between said second and third container and said growing medium being provided in said second chamber and said growing medium in said second chamber being accessible by roots of said plants in said first container through said openings in the sidewalls of said first and second containers.

4,100,700

WORKPIECE CONDITIONING GRINDER SYSTEM

Allen E. Peirce, Lynnwood; Robert F. Obear, Everett, and David E. Olson, Snohomish, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Dec. 7, 1976, Ser. No. 748,293
Int. Cl.[2] B24B *7/02*
U.S. Cl. 51—92 R 20 Claims



1. In a grinding machine for conditioning the surface of an elongated workpiece, said machine having a rotating grinding head and powered means for providing reciprocating movement between said grinding head and said workpiece along the longitudinal axis of said workpiece, a grinding machine control system, comprising:

vertical actuator means for controlling the grinding force exerted between said grinding head and said workpiece in a direction normal to the surface of said workpiece;

horizontal actuator means for incrementally moving said grinding head transverse to said reciprocating motion and providing an indication of the length of said increment;

power transducer means for providing an actual power indication corresponding to the mechanical power imparted to said grinding head about the rotational axis of said head;

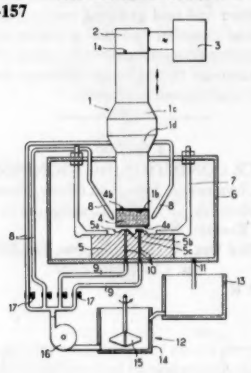
workpiece velocity transducer means for providing a workpiece velocity indication corresponding to the relative velocity between said workpiece and grinding head in the direction of said reciprocating motion;

calculator means receiving the output of said velocity transducer means and said horizontal actuator means, said calculator means utilizing said workpiece velocity indication and said increment length indication to compute a required power indication corresponding to the grinding

head rotational power required to form a cut having a predetermined depth under specific grinding conditions; and

comparator means receiving the outputs of said power transducer means and said calculator means to cause said vertical actuating means to increase said grinding force responsive to required power being greater than actual power, and to decrease said grinding force responsive to required power being less than actual power.

4,100,701
ULTRASONIC MACHINING
Louis Pierre Bessaguet, Landouge, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France
Filed Aug. 4, 1976, Ser. No. 711,444
Claims priority, application France, Aug. 5, 1975, 75 24409
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—157 **8 Claims**



1. In an ultrasonic machining installation for producing a relief contour on a work-piece by means of a tool, an improvement comprising:

means defining a machining enclosure;

means for securing said tool on the bottom of said enclosure;

a support for said work-piece above the bottom of said enclosure;

means for imposing ultrasonic frequency vibrations on said work-piece comprising:

an electrical ultrasonic frequency vibration generator;

a vibratory part coupled to said generator; and

a transducer for converting electrical oscillations into mechanical vibrations;

means for driving said work-piece vertically above the bottom of said enclosure;

means defining at least one passage for supplying an abrasive in a liquid vehicle, this passage delivering to the interior of the machining enclosure and being capable of supplying the abrasive/liquid mixture at a level above that of the upper face of said tool; and

a recycling assembly for recycling the abrasive/liquid mixture connected to an orifice situated in the bottom of said machining enclosure.

4,100,702
FAST GRIND FIXTURE
Bruno J. Zapart, 3624 N. Janssen St., Chicago, Ill. 60613
Filed Jun. 3, 1977, Ser. No. 803,087
Int. Cl.[2] B24B *41/04*
U.S. Cl. 51—216 H **8 Claims**

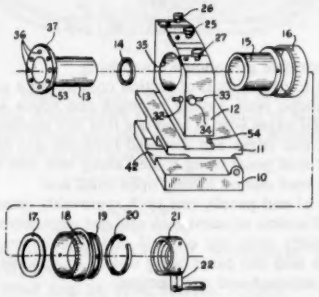
1. An indexing fixture adapted for operation with a work-holding collet, said fixture comprising;

a rigid upstanding housing generally rectangular in horizontal section, a cylindrical bore extending longitudinally through said housing;

a fixed cylindrical hollow open-ended tubular member snugly fitted coaxially in the bore of said housing and an outwardly directed radial rearward flange disposed at one end of said fixed member, said rearward flange interfacially engaging the rearward wall of said housing;

a revoluble hollow open-ended cylindrical spindle slip-fitted in said fixed tubular member and projecting rearwardly therefrom, and an outwardly directed radial forward flange at the forward end of said spindle, said flange being positioned forwardly beyond the forward wall of said housing;

a toothed indexing wheel rigidly secured to the rearwardly projecting portion of said spindle and indicating means



associated with the indexing wheel effective to designate the rotary angular position of said spindle;

a collet-receiving internally threaded manipulating ring loosely keyed to said indexing wheel and freely rotatable thereon;

at least one rotatable indexer extending downwardly through the top of said housing and having a portion movable into the rotary path of said indexing wheel;

a detent reciprocably slidable into and from said housing, said detent being disposed adjacent to said forward flange and selectively movable to engagement therewith;

at least one detent-engaging dog mounted on said forward flange adjacent to said housing; and

selectively positionable fastening means removably securing said dog to said flange along any chosen diameter of the forward flange.

4,100,703
AWNING ASSEMBLY
Raymond W. Sickler, R.D. 2, Wellsburg, N.Y. 14894
Filed Feb. 22, 1977, Ser. No. 770,791
Int. Cl.[2] E04D *13/08*
U.S. Cl. 52—16 **7 Claims**

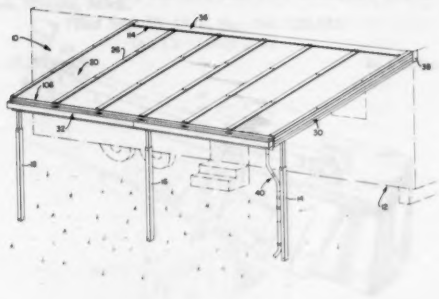
1. A roof comprising:

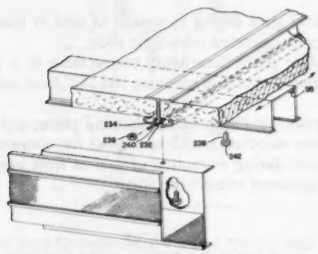
a plurality of elongate panels;

supporting means including support posts and roof supporting means connected on said posts for supporting said panels;

a plurality of elongate connecting means on the lateral edges of said panels for connecting adjacent panels together, said connecting means including a top flange adapted to contact a top surface of each adjoining panel connected by said each connecting means, a web member projecting downwardly from said top flange to contact a peripheral end edge surface of the adjacent ends of each of said adjoining panels, and a bottom flange adapted to contact a bottom surface of each of said adjoining panels, said connecting means bottom flanges each including a first horizontal segment attached at one side to said web, a vertical segment having one side thereof connected to another side

of said horizontal segment, a second horizontal flange attached at one side thereof to another side of said vertical segment and extending toward said web for defining a fastener receiving channel, an inclined segment attached at one side thereof to said vertical segment another side and angling outwardly and upwardly from said vertical segment another side, a U-shaped segment having one leg





thereof connected to another side of said inclined segment and another leg thereof extending towards said web and being essentially coplanar with said first horizontal segment to contact the undersurface of one of said panels; and

a plurality of fastener means connecting said connecting means to said roof supporting means, said fastener means each including a nut received in one of the channels defined by said channel defining means.

4,100,704

ADJUSTABLE TRANSOM ASSEMBLY

Eiryo Oogami, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 17, 1976, Ser. No. 724,594

Claims priority, application Japan, Sep. 22, 1975, 50-130425[U]

Int. Cl.[2] E04D *1/35*

U.S. Cl. 52—65 **9 Claims**

1. An adjustable transom assembly for attachment to a mullion having two portions inclined at an angle with respect to each other, comprising:

(a) a first member adapted to be fixed to one of the portions of the mullion and having an arcuate wall;

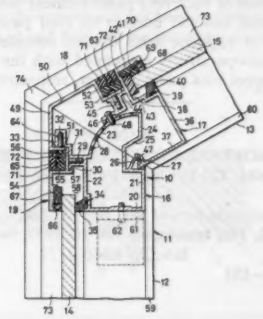
(b) first arcuate support means located substantially at the center of curvature of said arcuate wall and radially spaced from said arcuate wall, and carried by said first member;

(c) a second member adapted to be fixed to the other of the portions of the mullion;

(d) second arcuate support means carried by said second member and engaging said first arcuate support means and tiltable about the axis of said first arcuate support means with a corresponding variable portion of said arcuate wall being received in said second member;

(e) an arm secured to said second member and freely movable over the convex side of said arcuate wall remotely from both said arcuate support means, and releaseably connected to said arcuate wall at a selected position causing said second member to be inclined at the afore-mentioned angle with respect to said first member;

(f) a third member having a pair of wall portions inclined at



the first-mentioned angle with respect to each other and having their ends, as viewed in transverse cross-section, fixed to said first and second members, respectively, in surrounding relation to said convex side of said arcuate wall; and

(g) said arcuate wall being enclosed between said third member and said first and second arcuate support means.

4,100,705

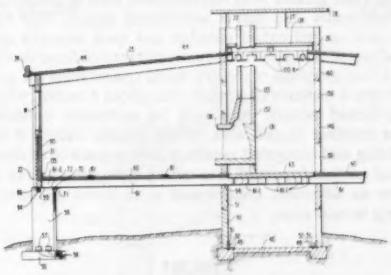
PRECAST BUILDING STRUCTURE

Silvio Diana, 203 Yoakum Pkwy., Alexandria, Va. 22304

Filed Feb. 10, 1977, Ser. No. 767,590

Int. Cl.[2] E04B *1/34*

U.S. Cl. 52—82 **19 Claims**



1. A building assembly comprising in combination a foundation system comprising a concrete slab means cast on the ground and having at least a central load bearing surface area and at least a perimetrical load bearing surface area along the line of the perimetrical walls of the building,

at least one precast central core member resting on the surface of said central load bearing surface of said slab, said at least one core member having an upper surface adapted to receive and support the beam end portions of a plurality of roof panel members as defined hereafter,

a plurality of precast wall members of equal length and defining a regular polygon bounded by straight sides of equal length with all the interior angles being equal and other than 90° and resting on said perimetrical load bearing surface of said slab,

a plurality of "T" beamed roof panel members, each beamed roof panel member having a central beam portion adapted to span between the central core member and the juncture

between two adjacent wall panel members and a pair of laterally flanged concrete portions disposed to equal sides, respectively, of said central beam member and tapering from the end resting on said walls inwardly to the end resting on said central core element, each of said pair of laterally flanged portions being dispersed to each side of said beam at an angle which is a function of the angle of inclination of each roof panel element with respect to the horizontal and the number of roof panel elements and having at opposite sides thereof complementary lapped edges co-operatively associated with the lapped edge of an adjacent roof panel member, respectively.

4,100,706

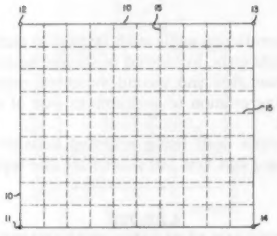
ADVERSE CONDITIONING SYSTEM

John A. White, 123-10 Ocean Promenade, Belle Harbor, N.Y. 11713

Continuation-in-part of Ser. No. 681,538, Apr. 29, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,411

Int. Cl.[2] E04B *1/72*

U.S. Cl. 52—101 **4 Claims**



1. A system covering an area of ground for adverse conditioning web-footed aquatic birds against roosting in said area, the system comprising a grid of intersecting elongated members each not greater than one-sixteenth inch in diameter and thus sufficiently thin that a web-footed aquatic bird cannot roost upon an individual member and each laterally spaced from adjacent elongated members a distance of from about 1 to about 6 feet, members of the grid being spaced from the ground at said area a distance no greater than about 8 inches, whereby a web-footed aquatic bird will be adversely conditioned against roosting in said area by the trauma caused it by its contacting said elongated members during some of its descents into and ascents from said area which will occur before it has become so adversely conditioned as to avoid alighting and roosting in said area.

4,100,707

TELESCOPIC BOOM FOR PORTABLE CRANES

Wilhelm Kranefeld, Wetter, and Helmut Schneider, Kamen-Methler, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

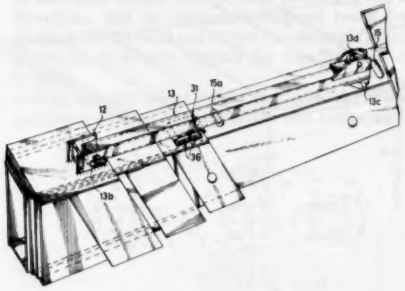
Filed Aug. 24, 1977, Ser. No. 827,306

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638185

Int. Cl.[2] B66C *23/04*

U.S. Cl. 52—115 **4 Claims**

1. A telescopic boom, for portable cranes, which comprises:
a main boom;
at least one hydraulically operated telescopic slide telescopically associated with said main boom;
at least one mechanically operated telescopic slide telescopically associated with said at least one hydraulically operated telescopic slide and said main boom, said at least one hydraulically operated telescopic slide and said at least one mechanically operated telescopic slide being adapted to be respectively extended from and retracted into said main boom, slots being provided along said at least one mechanically operated telescopic slide transverse to the direction of extension and retraction thereof;
a retaining rod, one end of which is detachably connectable to said main boom;
a pressure piece detachably connectable to a portion of the other end of said retaining rod;
a cam associated with said pressure piece for cooperation



with said slots during extension of said at least one mechanically operated telescopic slide;
a tensioning piece detachably connectable to a portion of said other end of said retaining rod 180° from said pressure piece;
a pawl associated with said tensioning piece; and
a stop cam associated with said pawl for cooperation with said slots during retraction of said at least one mechanically operated telescopic slide.

4,100,708

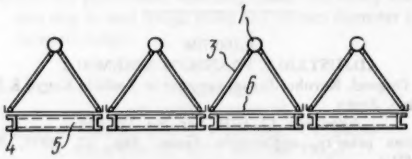
BUILDING ROOFING STRUCTURE

Anatoly Pavlovich Bobrovnikov, ulitsa Usacheva, 25, kv. 91; Gennady Grigorievich Mikhailov, ulitsa Bolotnikovskaya, 24, korpus 7, kv. 65; Gennady Ivanovich Soloviev, ulitsa Davydkovskaya, 6, kv. 102, and Sergei Grigorievich Chatchenko, ulitsa Govorova, 16, korpus 4, kv. 24, all of Moscow, U.S.S.R.

Filed Jan. 10, 1977, Ser. No. 757,973

Int. Cl.[2] E04C *3/10*

U.S. Cl. 52—222 **4 Claims**



1. A building roofing structure comprising a plurality of alike structural units disposed extending generally longitudinally in parallel relationship; each unit comprising a plurality of members connected to define an arch, a plurality of paired hangers connected to the arch disposed paired along the span of the arch substantially normal thereto in plan, each pair of hangars defining similar and equal sides of a triangular configuration in cross section with the arch defining the apex, each end of the arch being bifurcated and defining a pair of hangars at an angle relative to the longitudinal direction of the arch and each defining a continuation of the arch, laterally spaced parallel ties remote from the arch connected to respective ones of the paired hangers at ends thereof opposite to the ends thereof connected to said arch, each of the ties of each unit comprising a plurality of longitudinal chords, a plurality of crosspieces connecting the ties transversely of each of the corresponding units at points where the paired hangers are connected to

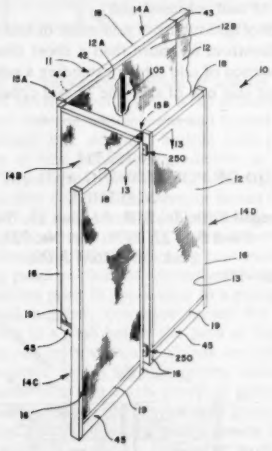
respective ones of the two parallel ties of a unit; and each unit having prestressed sheet material overlying the space between the parallel ties and crosspieces therein and secured to the ties to thereby participate in the load-bearing of each unit.

4,100,709

FRAME CONSTRUCTION FOR A DIVIDER WALL

Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Sep. 30, 1976, Ser. No. 728,383
Int. Cl.[2] E04B *2/74*
U.S. Cl. 52—239 **41 Claims**



1. A frame for a free-standing, vertical divider wall comprising: a plurality of structural components having identical generally C-shaped cross sections; each of which has a guideway having opposed flanges and extending longitudinally of said structural component at least in proximity to the ends thereof; at least two of said structural components being disposed as vertical support members; a connector plug received within at least the guideway of a vertically disposed support member; at least two of said structural components being horizontally disposed and vertically spaced as top and lower members; at least one anchor and at least one aligning block received within the guideway of a horizontally disposed member; said aligning block presents lug means which extend longitudinally outwardly of said horizontally disposed member; fastening means operative between said anchor and said connector plug to secure a corner connection between said horizontally and vertically disposed members in order to delineate a quadrilateral panel receiving locus; and, at least one notch recessed in said opposed flanges of said vertically disposed members, the lug means presented from said aligning block being received in said notch.

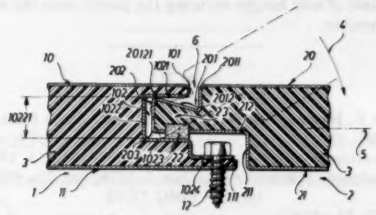
4,100,710

TONGUE-GROOVE CONNECTION

Josef Kowallik, Freudenberg, Fed. Rep. of Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Dec. 23, 1975, Ser. No. 643,623
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1974, 2461428
Int. Cl.[2] E04C *1/10*
U.S. Cl. 52—309.9 **8 Claims**

1. A tongue-groove connection which includes: a first member having an end face with a groove therein, a second member having an end face with a part thereof forming a tongue and engaging said groove, a sealing strip carried by said tongue intermediate the ends thereof and sealingly interposed between said tongue and groove, a screw means extending through a portion of said first member for connecting said first member to an under structure, said first member being at the outside thereof at the entrance to said groove provided with an abutment section, and said tongue being provided with a guiding surface for cooperation with said abutment section to aid the introduction of said tongue into said groove, the width of said groove being less than the total thickness of said tongue and sealing strip when the latter have not been introduced yet into said groove, each of said first and second members comprising



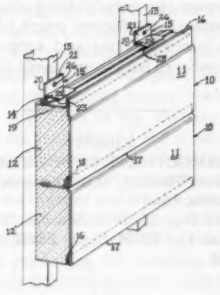
a core layer of synthetic hard foam with oppositely located main surfaces and with side surfaces laterally thereof, each of said first and second members also comprising two cover layers respectively covering said main surfaces, one of the ends of said groove having an extension which includes one of said main surfaces, and one of said cover layers for the other one of said main surfaces of said first member forming the side and bottom surfaces of said groove and also covering that side of said extension which faces away from said one of said main surfaces.

4,100,711

PREFABRICATED INSULATING PANEL

Victor Skuran, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.

Filed Jun. 16, 1977, Ser. No. 807,248
Int. Cl.[2] E04B *1/62, 2/00*
U.S. Cl. 52—489 **3 Claims**



1. A prefabricated insulating panel assembly adapted to be mounted in interconnected relationship with other panels on a support member comprising

(a) an outer metallic sheet carrying a batt of insulating material on its inner face,

(b) a covering flange provided by one horizontal edge of said outer sheet and extending over a portion of the top edge of the insulating material carried thereby,

(c) means provided by said one horizontal edge of said outer sheet extending perpendicularly with respect thereto for providing overlapping interconnection between corresponding means provided by a juxtapositioned panel adapted to be mounted upon the support member,

(d) a clip formed along the inner edge of said covering flange

and extending perpendicularly to and opening in the direction of said one horizontal edge of said sheet,

(e) a hanger mounted on said clip and providing a vertical mounting plate extending parallel to said outer metallic sheet,

(f) means on said hanger adapted to contact said clip so as to cam the same in the direction away from the support member when said clip is connected to said hanger and said panels are placed in interconnected juxtaposition upon the support member, and

(g) a fastener adapted to be carried by said vertical mounting plate of said hanger securing the panels onto the support member.

4,100,712

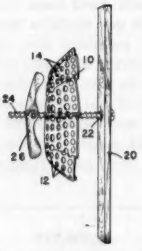
HOLE REPAIR KIT

Henry F. Hyman, 3718 Old San Jose Rd., Santa Cruz, Calif. 95065

Continuation-in-part of Ser. No. 664,374, Mar. 5, 1976, abandoned. This application Jun. 1, 1976, Ser. No. 691,506

Int. Cl.[2] E04G *23/02*

U.S. Cl. 52—514 **6 Claims**



1. A repair kit for holes in walls or the like which comprises only a single support plate dimensioned to bridge a hole to be repaired in a wall and having a flexible peripheral portion incuding partial radial slits extending inwardly from its peripheral edge which allows the plate to be pushed through the hole of smaller dimensions and subsequent expansion into hole-bridging relationship,

a reaction member of sufficient length to bridge the hole, and means interconnecting said support plate and said reaction member to hold them against opposed surfaces of the wall.

4,100,713

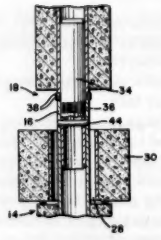
STRUCTURAL CONNECTION

Theodore W. Shoe, Fletcher, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

Filed Dec. 16, 1976, Ser. No. 751,029

Int. Cl.[2] E04H *12/00*; E06B *1/04*

U.S. Cl. 52—648 **6 Claims**



1. In a precast concrete structural framework including vertically superimposed, upper and lower, precast columns each having hollow tubing cast therein and extending longitudinally thereof, spindle means received in said tubing in non-vertical load transmitting relationship to said columns, means encircling said spindle means and transferring vertical load from said upper to said lower column, and a precast beam having a vertically extending opening therethrough, said beam intersecting said superimposed columns with said opening in said beam at the intersection thereof with said columns, the improvement comprising:

a portion of said tubing in one of said columns extending a substantial distance beyond an end thereof through said opening in said beam and toward an opposing end of the other of said columns, and

a portion of said tubing in said other of said columns extending therefrom no more than a short distance relative to said portion of said tubing extending a substantial distance beyond said end of said one of said columns.

4,100,714

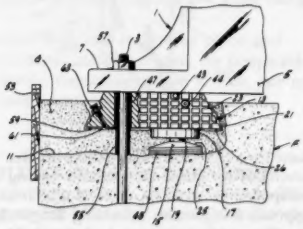
METHOD OF POSITIONING AND SUPPORTING A MACHINE

Morris Randall Stith, Jr., R.R. #1, Box 13, Webster, Ky. 40176

Filed Sep. 22, 1976, Ser. No. 725,374

Int. Cl.[2] F16M *5/00*

U.S. Cl. 52—741 **9 Claims**



1. The method of positioning and supporting an object, such as a large machine or other structure, on a foundation comprising the steps of:

placing a plurality of hydraulic jacking units between the foundation and the object, each of said units having a first member engageable with the object to be positioned and supported, a base member engageable with the foundation, and piston and cylinder means between the first member and the base member so that upon the application of hydraulic pressure to the piston and cylinder means, the first member moves relative to the base member, said first member having a generally downwardly facing surface;

introducing a liquid under pressure into each of said jacking units to move the object relative to the foundation to a selected position, said liquid constituting a hydraulic working fluid;

maintaining said liquid in each of said jacking units under pressure so as to support said object in its selected position;

introducing a flowable, hardenable material, such as grout, around the jacking units with the hardenable material filling the space between said downwardly facing surface and said foundation;

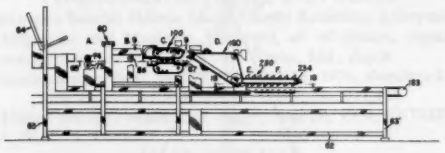
effecting the hardening of said hardenable material for fixing said jacking units in their selected positions; and

relieving said pressure from said liquid within said jacking units after said hardenable material has hardened so as to insure that substantially all of the loading applied to the jacking units by said object is carried by said hardenable material bearing against said downwardly facing surface.

4,100,715
BOTTLE PACKAGING MACHINE

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Jun. 13, 1977, Ser. No. 805,855
Int. Cl.[2] B65B *21/24*
U.S. Cl. 53—48 19 Claims

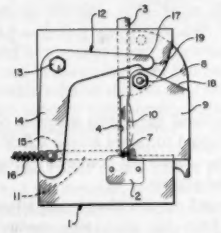


1. A machine for packaging a group of articles having the general shape of beverage bottles in a wrap-around type blank of foldable sheet material which is cut and scored to provide hingedly connected top, side and bottom wall panels with certain portions of said panels being adapted to be initially folded at least in part prior to assembly with a group of the articles, said machine comprising conveyor means for continuously advancing cut and scored blanks through successive work stations, continuously traveling means at certain of said work stations along said blank advancing conveyor means for partially folding panel portions of successive blanks into package forming position prior to application to a group of articles of predetermined number, conveyor means for advancing groups of articles in a path below the path of travel of said blank advancing conveyor means to a blank and article assembly station, conveyor means for transferring successive partially folded blanks from said blank conveyor means to a position at said assembly station for deposit on a group of articles advancing on said article conveyor means, means operative at said assembly station for seating successive partially folded blanks on said groups of articles and means disposed along said article conveyor means for further folding certain of the panels and securing the same in final package forming position.

4,100,716
CLAMPING MACHINE

Angel Lorenzo Barroso, Ronda Carlos III, s.n., Mataro (Barcelona), Spain

Filed Jan. 22, 1976, Ser. No. 651,423
Claims priority, application Spain, Jan. 24, 1975, 209.592[U]
Int. Cl.[2] B65B *51/08*
U.S. Cl. 53—138 A 5 Claims

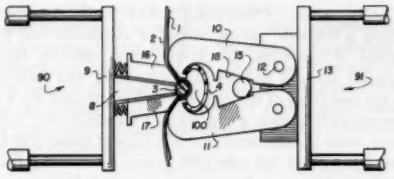


1. A clamping machine for closing sausage casing by means of a clamp comprising a support plate, means forming an opening in said support plate for the introduction of sausage casing to be clamped, a closing piece capable of rotating on said plate to close said opening for clamping, a clamp pushing device, a closing die including a clamp receiving portion, means forming a passage interior of said support plate with said passage opening into said receiving portion, a bar disposed in said passage, said bar being movable in said passage between a retracted position in which said bar is withdrawn into said passageway and an ejection position in which said bar projects from said passageway into a position for contacting and displacing a recently closed clamp on said die, a lever on said support plate having a pivot and two arms, one arm being connected to said bar and the second arm contacting an edge of said closing piece such that rotation of said closing piece causes said lever to move said bar from said retracted position to said ejection position so as to project from said passage and contact and thereby dislodge a recently closed clamp from said die.

4,100,717
FOLDED SEAL FOR PLASTIC SHEETING AND FORMING APPARATUS

Martti Kontinen, Ohjaajantie 16 A 12, 00400 Helsinki 40, Finland

Filed Mar. 7, 1977, Ser. No. 775,198
Claims priority, application Finland, Jun. 2, 1976, 761562
Int. Cl.[2] B65B *51/04, 7/06*
U.S. Cl. 53—138 R 2 Claims



1. An apparatus for making a seal having a retaining rod wrapped with a portion of sheeting material to be sealed and enveloped by a slotted tube having slot edges biased toward each other comprising: a guide means for supporting the retaining rod, sealing means spaced from said guide means and movable toward said guide, said sealing means gaving gripping surfaces for supporting the slotted tube in a manner so as to hold the slotted tube with its slot edges facing the retaining rod held in said guiding means, means for positioning sheeting material to be sealed between said guide and sealing means, means for moving said sealing means toward said guiding means to cause a portion of the sheeting material to be wrapped around the retaining rod and to direct the retaining rod with the sheeting material therearound into the slot of said slotted tube, said slotted tube being closable over said sheeting and said rod and the edges of said tube bounding said slot being movable together to seal said sheeting; said guiding means further comprising a carriage, a thrusting bar extending from said carriage for supporting the retaining rod, at least one guiding jaw slidably mounted to a side of said thrusting bar and biased toward the retaining rod to form a guide space with said thrusting bar for the retaining rod; said sealing means further comprising a second carriage which is movable with respect to said guiding means carriage, a second thrusting bar for supporting the slotted tube in a position facing the retaining rod held in said thrusting bar of said guiding means, at least one guiding jaw slidably mounted to a side of said second thrusting bar and biased toward the slotted tube held by said second thrusting bar to form a second guiding spaced for said slotted tube, said retaining rod guiding space and said slotted tube guiding space being combined when said sealing means is moved toward said guiding means and said space being reduced in size when said guiding jaws of said guiding means and sealing means are forced against each other and against said respective guiding jaw biasing.

4,100,718
MEANS FOR THE PRODUCTION AND FILLING OF A PARALLELEPIPEDIC PACKET

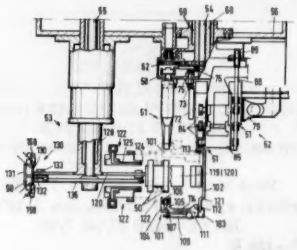
Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,267

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613277

Int. Cl.[2] B65B *11/28, 49/08*

U.S. Cl. 53—234 **50 Claims**



1. An apparatus for the production of parallelepipedic packets from a foldable cut-out shape of composite foil for the reception of cigarettes, the cut-out shape tubularly enclosing the packet content and having protruding end flaps folded over the end faces of the cigarettes, characterised by: a winding turret (**52**) having a plurality of mandrels (**51**) mounted thereon, each for the reception of a cut-out shape (**32**) for the production of a packet tube (**50**), means for rotating the mandrels about their own longitudinal axes, a folding turret (**53**) having devices mounted thereon for filling the packet tube (**50**) and closing it by folding its end flaps (**40** to **43**), and means for transfering the packet tube from the winding mandrels to the folding turret.

4,100,719
FLOATING HOOK ARRANGEMENT FOR AN APPARATUS FOR BAGGING GARMENTS

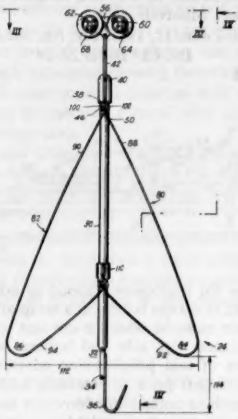
Murray Jelling, Roslyn Heights; Alexander Kahn, Massapequa; Ernest George Moore, East Meadow, and Michae' Friedman, Brooklyn, all of N.Y., assignors to U.S. Dynamics Corporation, Amityville, N.Y.

Continuation of Ser. No. 707,653, Jul. 22, 1976, Pat. No. 4,027,461. This application Mar. 16, 1977, Ser. No. 778,237

Int. Cl.[2] B65B *43/26, 67/02*

U.S. Cl. 53—241 **7 Claims**

1. Apparatus comprising a hook, and means supporting said hook in suspended relation and including an elongated support connected to said hook and further means on said support and longitudinally aligned with said hook for spreading bags pulled down over said hook to enable articles suspended on said hook to be bagged while protecting the bags from the hook, said further means having a transverse dimension at least equal to



that of said hook, said further means flaring outwardly and downwardly towards said hook.

4,100,720
GRAIN TANK AND GRAIN CONVEYOR MEANS OF HARVESTING MACHINES

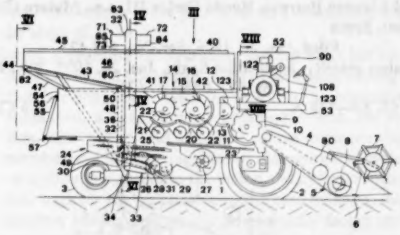
José A. C. L. Carnewal, Eeklo; Frans J. G. C. Decoene, Zedelgem, both of Belgium, and Cornelis G. M. Muijs, Flagey-Echezeaux, France, assignors to Clayson N.V., Zedelgem, Belgium

Filed Jun. 23, 1976, Ser. No. 699,114

Claims priority, application United Kingdom, Jun. 26, 1975, 27066/75

Int. Cl.[2] A01D *45/00*

U.S. Cl. 56—14.6 **22 Claims**



1. An agricultural harvesting machine comprising:

a chassis adapted to travel across a field,

means on the chassis for conveying crop material from the field to the chassis,

means mounted on said chassis and adapted to receive crop material from the conveying means for threshing and separating grain from the crop material,

means mounted on said chassis for receiving threshed and separated grain from the threshing and separating means and for cleaning said grain,

a grain tank pivotally mounted on said chassis at a location above the level of the cleaning means for temporarily holding cleaned grain therein,

conveyor means mounted between the cleaning means and the grain tank for loading cleaned grain in the grain tank and

means connected between the chassis and the grain tank for

tipping the grain tank and for discharging grain contained therein rearwardly of the machine.

4,100,721

APPARATUS FOR TWISTING INSULATED CONDUCTORS FOR USE IN MULTICONDUCTOR COMMUNICATION CABLE INTO QUADS

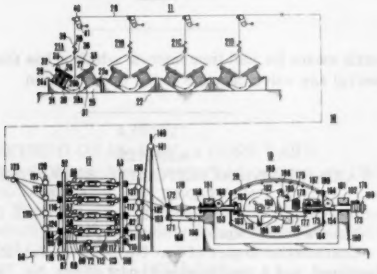
Nishikawa Seiichi; Hasebe Shuji; Ohashi Kazuhiko; Kobayashi Shigeyuki, and Maekawa Kazuyuki, all of Sakura, Japan, assignors to The Fujikura Cable Works, Ltd., Japan

Continuation of Ser. No. 578,105, May 16, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,628

Claims priority, application Japan, Jun. 28, 1974, 49-73225; Jul. 29, 1974, 49-85988

Int. Cl.[2] H01B *13/02*

U.S. Cl. 57—34 AT **22 Claims**



1. A twisting apparatus for twisting insulated conductor wire used in the manufacture of cables, comprising:

(a) a pay-off means including four bobbin holder sets each set comprising a pair of bobbins, guide means over each of said bobbin holders so that a spool with insulated conductor wire thereon on one of said pair can be idle and replaced while a spool on the other bobbin holder of said pair is paying off insulated conductor wire and when material from said other spool is exhausted, said one spool pays-off insulated conductor wire as said other spool is idle;

(b) pre-twisting means for providing S and Z direction twists to said insulated conductor wire comprising four pre-twisting units, each pre-twisting unit having a tubular fore rotary member and a tubular rear rotary member, means for driving said fore and rear rotary members at the same speed, means for periodically reversing the directions of rotations thereof at the same time, frame means for rotatably supporting said fore and rear rotary members on a straight line and in a spaced apart relationship, a floating platform disposed between said fore and rear rotary members to be rotatable relative thereto, said floating platform comprising two pairs of substantially rectangular plates, one of said pairs rotatably mounted to said fore rotary members, the other pair rotatably mounted to said rear rotary member, each plate of said pair of plates connected to each other by a pin member, said pin member extending substantially perpendicular to each plate, a connecting plate means for connecting the pair of plates mounted adjacent the fore rotary member to the pair of plates mounted adjacent the rear rotary members, a fore guide pulley centrally mounted between said pair of plates mounted to said fore rotary member on said pin member, a rear guide pulley centrally mounted between said pair of plates mounted to said rear rotary member on said pin member, a plurality of insulated conductor wire accumulating pulleys mounted on both sides of said fore and rear guide pulleys on both of said pin members, a pair of deflecting pulleys mounted to said connecting plate means, said deflecting pulleys having their axes of rotation perpendicular to said pin member, an inlet guide roller mounted on the inlet side of said fore rotary member, an outlet guide roller mounted on the outlet side of said rear rotary member, a plurality of guide means provided for said fore and rear rotary members and mounted thereon, means for passing an insulated conductor wire paid off from said pay-off means successively through said inlet guide roller, one guide means of said fore rotary member, one guide means of said rear rotary member, and from the rear guide means to the rear guide pulley, alternately around said front and rear accumulating pulleys on one side of said guide pulley, around said pair of deflecting pulleys, and alternately around said front and rear accumulating pulleys on the other side of said guide pulley, and then around said fore guide pulley, the other guide means of said fore rotary member, the other guide means of said rear rotary member and said outlet guide roller;

(d) a twisting means for receiving four insulted conductor wires from the pre-twisting means and twisting them into a star quad including a converging die receiving said pre-twisted insulated conductor wires, a tubular rotary member fed by said die, a flyer and a near and far end fed by said tubular rotary member at the near end and an end guide roller at the far end, a drive wheel within said flyer adapted to receive several turns of insulated conductor wire fed by said end guide roller;

(d) a take up bobbin in said flyer fed by said drive wheel for taking up the twisted star guad; and

(e) said pretwisting means being operable independently of said twisting means to vary the number of pretwists provided to individual insulated conductor wires and to vary the ratio of the number of pretwists to the pitch of twisting of the resultant star quad whereby capacitance imbalance is made more uniform and cross-talk characteristics of the star quad optimized.

4,100,722

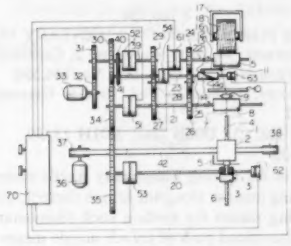
METHOD OF AUTOMATICALLY PIECING UP A YARN IN AN OPEN-END SPINNING MACHINE AND AN OPEN-END SPINNING MACHINE FOR CARRYING OUT THE SAME

Osamu Suzuki, Obu; Shozo Ueda, Kariya, and Ichiro Tashiro, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Apr. 18, 1977, Ser. No. 788,126

Int. Cl.[2] D01H *13/04, 15/00*

U.S. Cl. 57—34 R **5 Claims**



2. An open-end spinning machine comprising:

feed rollers for supplying fibers to a combing roller so as to comb said fibers;

a spinning rotor for collecting said combed fibers into a yarn and for twisting said yarn;

a delivery tube disposed at a position upstream of said spinning rotor;

a pair of draw off roller means for withdrawing said yarn from said spinning rotor, said draw off roller means being disposed so as to be rotatable in both normal and opposite rotating directions;

a traverse guide for traversing said yarn along a bobbin;

a winding drum for rotating said bobbin by engaging said bobbin along a line of contact therebetween to wind said yarn around said bobbin and form a cheese, said winding drum being disposed so as to be rotatable in both normal and opposite rotating directions; and

controlling means, for controlling said feed rollers, said spinning rotor, said pair of draw off roller means, said traverse guide and said winding drum according to a predetermined program, the traverse of said traverse guide being started after a pieced joint between an end of said yarn and a newly spun yarn reaches the line of contact between said winding drum and said cheese wound around said bobbin.

4,100,723

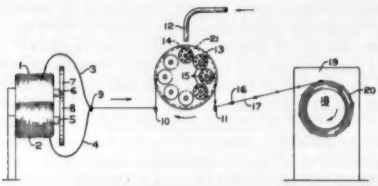
APPARATUS FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Bohy, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,198, Dec. 9, 1976, and a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,690

Int. Cl.[2] D02G *3/34*

U.S. Cl. 57—34 B **2 Claims**



1. An apparatus for producing a slubby strand comprising in combination a surface including means to receive a textile strand thereon, means to rapidly draw said textile strand from said surface and means to introduce high pressure fluid onto said surface and to create a pair of fluid vortices above said surface while said strand is being drawn over said surface to thereby produce slubs in said strand.

4,100,724

APPARATUS FOR DYEING FILAMENTARY MATERIAL

Karl Bous, Sternstr. 74, 5600 Wuppertal 2, Germany

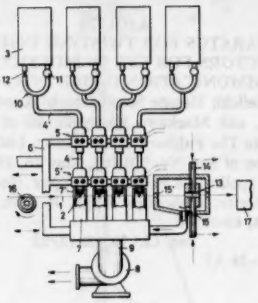
Filed Nov. 23, 1976, Ser. No. 744,394

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554132

Int. Cl.[2] D06B *1/02;* D01H *13/30*

U.S. Cl. 57—35 **12 Claims**

1. Apparatus for dyeing filamentary textile material or the like in a varying manner along the length thereof, the combination comprising means for feeding such filamentary material along a predetermined path of travel; nozzle means for spraying a fluid dye; means for maintaining said filamentary material under tension and moving said filamentary material at high speed as it moves along said path of travel; said nozzle means being located adjacent said path of travel whereby spray emitted from said nozzle means may engage said filamentary material; a source of fluid dye; conduit means for conveying fluid dye from said dye source to said nozzle means; a plurality of valve means disposed in said conduit means in series relation; and means for opening and closing said valve means in adjustable phase relationship whereby short dye spray pulses are generated and emitted through said nozzle means; said valve means being actuated by the opening and closing means into open and close positions in an out-of-phase relationship such that said plurality of valve means are all open for a time interval enabling fluid dye to pass from said conduit means into said



nozzle means for said time interval which is less than the time interval any valve means is in the open position.

4,100,725

YARN HAVING ALTERNATING ENTANGLED AND UNENTANGLED LENGTHS

Bernard Magel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 599,144, Jul. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 708,209, Jul. 23, 1976, abandoned. This application Sep. 20, 1976, Ser. No. 725,017

Int. Cl.[2] D02G *3/22, 3/34*

U.S. Cl. 57—140 J **33 Claims**

1. A yarn of organic fibers which has zero twist and random lengths of tightly entangled fibers as nodes having substantially zero twist, the nodes comprising an average of about 20%-70% of the yarn length, and having a retentivity of at least 75% and alternating with random lengths of substantially unentangled asymmetrically splayed fibers in intervals having an average length of about 3–12 mm.

4,100,726

METHOD FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Bohy, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

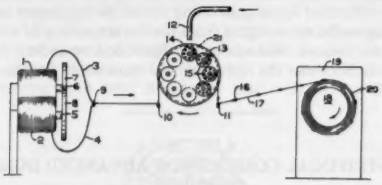
Division of Ser. No. 749,198, Dec. 9, 1976, and a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,689

Int. Cl.[2] D02G *3/34*

U.S. Cl. 57—157 F **11 Claims**

1. A method of providing a slubby strand of fibers comprising passing a consolidated strand containing a multiplicity of

fibers over a surface, introducing onto the surface of the strand a fluid at high pressure continuously, twisting and bulking the



strand with said fluid, and collecting from said surface a twisted strand having slubs thereon.

4,100,727

METHOD OF MAKING A CORE YARN

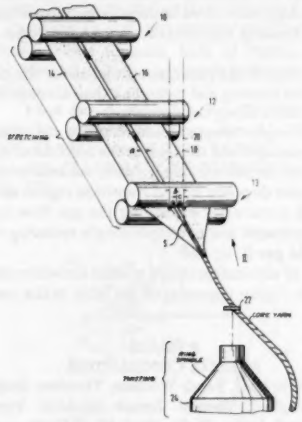
Edmund Hamel, Romanshorn, Switzerland, assignor to OFA AG, Horn, Switzerland

Filed Apr. 22, 1977, Ser. No. 790,088

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645119

Int. Cl.[2] D02G *3/38*

U.S. Cl. 57—160 **11 Claims**



1. A process for producing a core yarn comprising the steps of:

stretching a pair of fiber-fleece slubbing strips in a stretching apparatus having a plurality of roller pairs engaging the slubbing strips in the nips thereof, the slubbing strips emerging from a last roller pair of said apparatus;

maintaining a close spacing of proximal edges of said slubbing strips at least in and through the nip of said last roller pair with said spacing being less than 2 mm;

feeding respective core threads onto said slubbing strips in the nip of said last roller pair with each of the core threads being spaced from the respective proximal edge by a distance less than the width of the respective slubbing strip; and

twisting both of said slubbing strips and said core threads together immediately downstream of said last roller pair to form the core yarn.

4,100,728

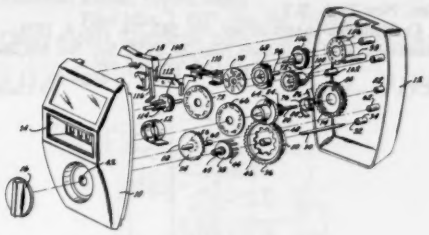
MECHANICAL DIGITAL STOPWATCH

Richard Shih-Teng Chang, Rolling Hills Estates, and Edmund Emil Landsinger, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 26, 1976, Ser. No. 745,287

Int. Cl.[2] G04F *7/04*

U.S. Cl. 58—74 **6 Claims**



1. In a mechanical watch for measuring a period of elapsed time, the combination comprising:

a housing having a display window;

spring means within the housing;

windup means for winding said spring means;

a decade counter within said housing and having a digital output for displaying in said display window a plurality of digits indicative of the elapsed time measurement;

a ratchet mechanism operatively connected between said counter and said windup means and responsive to the winding thereof for resetting said counter, said ratchet mechanism including a pawl member coupled with an internally toothed ratchet gear;

escapement means; and

switch means operable to enable said spring means to actuate said decade counter under control of said escapement means, said pawl member being rotatable with respect to said ratchet gear when said windup means is actuated with said switch means disabled and being rotated with said ratchet gear when said switch means is enabled.

4,100,729

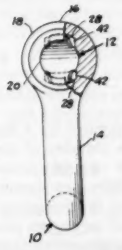
CHAIN SHACKLE

Avellino J. Bartoletto, 25460 Novi Rd., Novi, Mich. 48050

Filed Jul. 11, 1977, Ser. No. 814,441

Int. Cl.[2] F16G *15/02*

U.S. Cl. 59—86 **18 Claims**



1. In combination, a shackle having a generally U-shaped body portion terminating in a pair of laterlly space opposed ears, each ear having a bore therein axially aligned with the bore in the other ear, at least one of said bores extending completely through its respective ear, said one bore being radially enlarged at an axial portion thereof intermediate its ends, a pin extending through said one bore and into the other bore, said pin having a pair of generally axially extending fingers at the

end thereof disposed within said one bore, said fingers being flared radially outwardly into said enlarged bore portion to thereby lock the pin axially on the shackle.

4,100,730

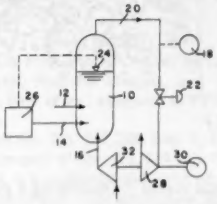
REGULATION OF A WET AIR OXIDATION UNIT FOR PRODUCTION OF USEFUL ENERGY

Louis Atwater Pradt, Wausau, Wis., assignor to Sterling Drug, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 583,754, Jun. 4, 1975, abandoned. This application May 24, 1976, Ser. No. 689,264

Int. Cl.[2] F02C *3/20*; F02G *3/00*

U.S. Cl. 60—39.05 **15 Claims**



1. A wet oxidation apparatus comprising a reactor, means for continuously introducing combustible materials, water and an oxygen containing gas into the reactor, the heat of combusion of the material in the reactor being sufficient to evaporate substantially all of the water introduced into the reactor in excess of that necessary to maintain a substantially constant liquid level in the reactor, and means controlling the quantity of water fed to the reactor to maintain the water level therein substantially constant, and a gas and water vapor outlet for the reactor.

4,100,731

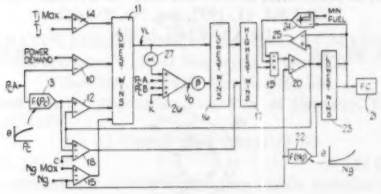
FUEL CONTROL FOR A MULTI-ENGINE GAS TURBINE INSTALLATION

Roderick Stewart Janes, Solihull, and Maurice Edward Lloyd, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 1, 1976, Ser. No. 746,347

Int. Cl.[2] F02C *9/02, 9/08*

U.S. Cl. 60—39.15 **4 Claims**



1. An electronic fuel control for a multi engine gas turbine installation comprising a plurality of control channels for the respective engines, each control channel including an error signal integrator, first difference signal generating circuit for comparing the output of the integrator with a signal corresponding to the value of an engine parameter, a fuel supply system controlling the supply of fuel to the associated engine in accordance with the output of the first difference signal generating circuit, error signal generating means for comparing the desired value of an engine parameter with the actual value thereof, limiter means for limiting the output of the error signal generating means during acceleration to a value determined by engine operating conditions, the output of said limiter means being applied as said error signal to the integrator when the engines are running in a normal matched condition, and further limiter means in each channel for further limiting the output of said limiter means when the values of a parameter of the engine controlled by that channel and of the other or another engine of the system differ, said further limiter means including a second difference signal generating circuit having inputs corresponding to the error signal from the limiter means of at least one of the control channels and a signal corresponding to the difference between the value of said parameter for the two engines.

4,100,732

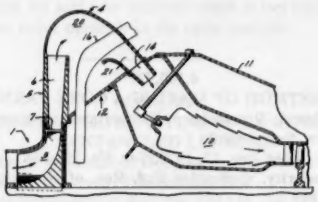
CENTRIFUGAL COMPRESSOR ADVANCED DUMP DIFFUSER

Alexander Connor Bryans, Reading; Barry Weinstein, Georgetown; Neil Roger Brookes, Topsfield, and John William Vdoviak, Marblehead, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 2, 1976, Ser. No. 746,974

Int. Cl.[2] F02C *3/08*

U.S. Cl. 60—39.36 **3 Claims**



1. A diffuser for diffusing the accelerated gas flow from a centrifugal compressor to an annular combustor comprising:

an annular housing circumscribing the centrifugal compressor;

a plurality of diffuser passages spaced about the circumference of the housing and extending therethrough for diffusing the flow exiting the compressor;

a transition region disposed intermediate the outlet of the diffuser passages and the inlet to the combustor said transition region further including a reduced area neck portion,

plenum means disposed in said transition region upstream of said neck portion for expanding the gas flow exiting the diffuser passages and correspondingly reducing the velocity of said gas flow; and

a plurality of circumferentially spaced deswirl vanes in said transition region upstream of the inlet to the combustor.

4,100,733

PREMIX COMBUSTOR

Edmund Emil Striebel, South Windsor; Theodore Richard Koblish, Wallingford; Thomas Joseph Madden, Vernon, and Roger Halsted James, Wallingford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1976, Ser. No. 729,436

Int. Cl.[2] F02C *7/22*

U.S. Cl. 60—39.74 B **30 Claims**

1. Fuel supply means comprising:

an essentially cylindrical member forming the outer wall of the supply means;

an upstream plate-like member which is affixed to the cylindrical outer wall and which forms the upstream wall of the supply means;

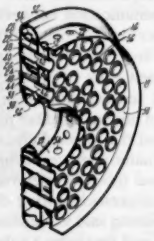
a downstream plate-like member which is affixed to the cylindrical outer wall at a location spaced axially from the upstream plate-like member forming a fuel chamber therebetween;

a divider which is spaced axially between the upstream and downstream plate-like members to form a primary section and an axially adjacent, secondary section within the fuel chamber;

means for directing fuel to the primary section of the fuel chamber;

means for directing fuel to the secondary section of the fuel chamber;

a plurality of open ended, mixing tubes which penetrate the upstream and downstream plate-like members and are adapted to flow air therethrough across the fuel supply means, each tube having at least one orifice through



which fuel is flowable from the primary section for mixing with the through flowing air; and

a plurality of open ended, mixing tubes which penetrate the upstream and downstream plate-like members and are adapted to flow air therethrough across the fuel supply means, each tube having at least one orifice through which fuel is flowable from the secondary section for mixing with the through flowing air.

4,100,734

EXHAUST GAS PURIFICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

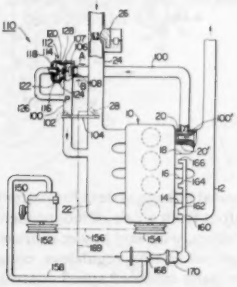
Tadashi Ozaki; Tokio Kohama, both of Nishio, and Hideki Obayashi, Hoi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 4, 1977, Ser. No. 756,702

Claims priority, application Japan, Jan. 12, 1976, 51-2546; Jan. 23, 1976, 51-6937; Mar. 5, 1976, 51-24342

Int. Cl.[2] F02M *25/06;* F02B *75/10*

U.S. Cl. 60—278 **20 Claims**



1. An exhaust gas purification system for an internal combustion engine comprising an E.G.R. passage for recirculating engine exhaust gases from an exhaust system of an internal combustion engine back into an intake system thereof downstream of a throttle valve of said engine, a first E.G.R. control valve disposed in said E.G.R. passage and operatively connected to said throttle valve to control the E.G.R. flow through said E.G.R. passage into said engine, a second E.G.R. control valve disposed in said E.G.R. passage upstream of said first E.G.R. control valve to control the E.G.R. flow through said E.G.R. passage toward said first E.G.R. control valve, and means for controlling said second E.G.R. control valve so that the pressure of engine exhaust gases in said E.G.R. passage between said first and second E.G.R. control valves is maintained substantially constant.

4,100,735

SECONDARY AIR CONTROL SYSTEM IN AN INTERNAL COMBUSTION ENGINE

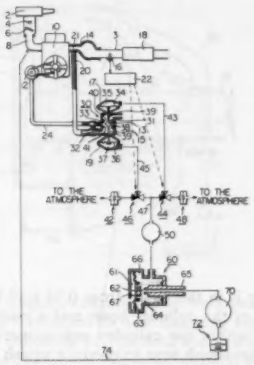
Hideo Miyagi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 7, 1977, Ser. No. 775,031

Claims priority, application Japan, Nov. 15, 1976, 51-136241

Int. Cl.[2] F01N *3/10;* F02B *75/10*

U.S. Cl. 60—276 **12 Claims**



1. A secondary air control system in an internal combustion engine comprising a diaphragm-operated secondary air control valve for feeding a controlled amount of secondary air from an air pump into an exhaust system of the engine and a vacuum switching valve means for alternately switching circuits of an operative vacuum which acts on said secondary air control valve, in response to the A/F equivalence ratio λ of the exhaust gas, wherein the improvement comprises a vacuum control valve provided with a diaphragm chamber which is connected to said vacuum switching valve means via a first vacuum reservoir tank and is connected to an intake vacuum area via a second vacuum reservoir tank having a check valve which opens only when the intake vacuum is stronger than the vacuum in the second vacuum reservoir tank for storing the higher vacuum in said secondary vacuum reservoir tank, the connection of said diaphragm chamber of said vacuum control valve and said second vacuum reservoir tank being established only when said vacuum control valve is in an open position, said vacuum control valve being opened when the vacuum in said first vacuum reservoir tank reaches below a predetermined value thus filling said first vacuum reservoir tank with the higher vacuum stored in said second vacuum reservoir tank, and resulting in maintaining the operative vacuum in said first vacuum reservoir tank substantially constant.

4,100,736

SPARK-IGNITION INTERNAL COMBUSTION ENGINE EQUIPPED WITH EXHAUST GAS RECIRCULATION SYSTEM

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, and Yasuo Takagi, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 19, 1976, Ser. No. 687,932

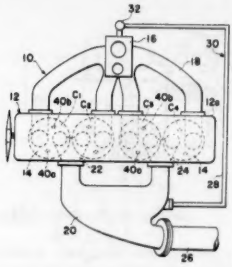
Claims priority, application Japan, May 22, 1975, 50-61274

Int. Cl.[2] F02M *25/06*

U.S. Cl. 60—278 **7 Claims**

1. A spark-ignition internal combustion engine having a cylinder with a bore therein of a specified diameter, comprising:

means defining a combustion chamber capable of producing squish turbulence of the air-fuel mixture supplied from the air-fuel mixture supply means of the engine, the combustion chamber defining means including a cylinder head having a radially disposed flat surface closing the upper end of the cylinder, said cylinder head having a hemispherical concavity formed concentrically with the bore of the cylinder, said hemispherical concavity forming a major part of the combustion chamber and being smaller in diameter at said radially disposed flat surface than that of the cylinder bore thereby defining an annular flat squish area and in which the diameter of said hemispherical



concavity is in the range from 0.94 to 0.99 times of the diameter of the cylinder bore, and a piston reciprocally disposed within the cylinder and cooperating with said annular flat squish area to produce squish turbulence;

exhaust gas recirculating means for recirculating the exhaust gases of the engine into the combustion chamber in the maximum amount of 10 to 50% by volume of the amount of the intake air which is inducted through the air-fuel mixture supply means into the combustion chamber; and

a plurality of spark plugs disposed in the combustion chamber for igniting the air-fuel mixture containing the exhaust gases.

4,100,737

EXHAUST GAS PURIFYING SYSTEM EMPLOYING AN EXHAUST GAS FLOW CONTROLLER

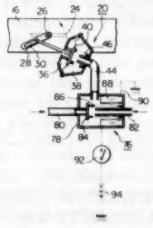
Kunihiko Sugihara, Yokohama City, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 7, 1976, Ser. No. 674,832

Claims priority, application Japan, May 21, 1975, 50/60668

Int. Cl.[2] F02B *75/10*

U.S. Cl. 60—292 **3 Claims**



1. An exhaust gas purifying system for use with an internal combustion engine having an intake conduit system and an exhaust conduit system, said intake conduit system including an air-fuel mixture supply means having an air-fuel mixture passage downstream of a throttle valve, said exhaust gas purifying system comprising: an afterburning device disposed in use in said exhaust conduit of said internal combustion engine, said afterburning device comprising an oxidizing catalyst converter or a thermal reactor; a damper door swingably disposed in said exhaust conduit downstream of said afterburning device for partially closing and fully opening a discharge passage of said exhaust conduit; a damper door actuator having therein a moveable member actuated in response to application of a vacuum to said actuator; linkage means for transmitting the movements of said moveable member to said damper door to rotate said damper door in a direction to partially close the passage of said exhaust conduit system when a vacuum is applied to said actuator; a solenoid valve having a first casing, a tube providing communication between the casing and the interior of said damper door actuator; first and second tubes projecting into said first casing from opposite sides of said casing and having open ends facing each other in said first casing, said first and second tubes being in communication with the interior of an air-fuel mixture passage in the internal combustion engine and the atmosphere, respectively; a valve member of magnetic material moveable between the open ends of said first and second tubes to selectively and alternatively close the same; a compression spring disposed in said first casing continuously biasing said valve member in a direction to close the open end of said first tube; a solenoid coil disposed in said first casing attracting said valve member when energized to move it to close the open end of said second tube; and a throttle valve switch electrically connected to said solenoid coil to control energization of said coil when the throttle valve of said intake conduit system almost closes said air-fuel mixture passage.

4,100,738

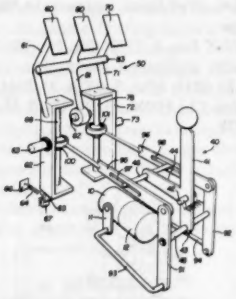
METHOD AND APPARATUS FOR STEERING

David H. Seaberg, Davenport, and Gou-Lian Kao, Bettendorf, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 17, 1977, Ser. No. 778,409

Int. Cl.[2] F16D *31/00;* **F15B** *13/09*

U.S. Cl. 60—327 **11 Claims**



1. A mechanical linkage system for independently regulating the power output from a pair of independently operable, variable power sources, with said power sources having respective displaceable output control regulators, comprising:

a single, pivotally mounted speed control lever;

a pair of first linkage means interconnecting said speed control lever with a respective output control regulator for equally displacing said regulators upon pivotal movement of said speed control lever to obtain equivalent power output from each of said power sources;

a pair of independently movable power reducing members; and

a pair of second linkage means respectively interconnecting each power reducing member with one of said first linkage means for independently varying the output of one of said power sources upon independent movement of one of said power reducing members, without moving the control lever and without varying the output of the other power source.

4,100,739

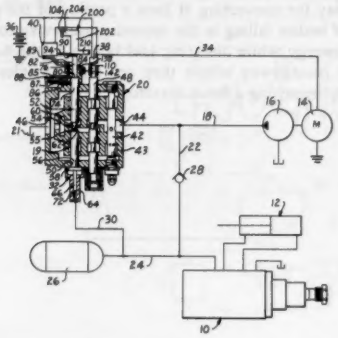
PRESSURE SENSITIVE CHARGING MEANS FOR A STEERING SYSTEM

Walter Moore Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 759,953, Jan. 17, 1977, abandoned. This application Sep. 16, 1977, Ser. No. 833,898

Int. Cl.[2] F15B *1/02, 11/16*

U.S. Cl. 60—413 22 Claims



15. A control member, a valve spool, said control member slidably carried on said valve spool, a retaining means for retaining said control member in one of at least two positions relative to said valve spool, actuation means operatively connected to said control member for moving said control member in one direction only relative to said valve spool until said retaining means engages with an abutment, resilient means urging said control member and said valve spool in a direction opposite to the direction of movement by said actuation means, and means for independently moving said valve spool in a direction opposite to the direction of movement by said actuation means.

4,100,740

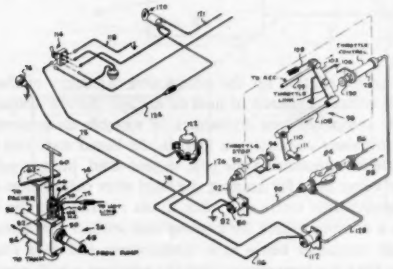
REFUSE VEHICLE HYDRAULIC SUPPLY SYSTEM

Melvin E. Stewart, Rapidan, Va., assignor to City Tank Corporation, Culpeper, Va.

Filed May 23, 1977, Ser. No. 799,648

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—431 17 Claims



1. A hydraulic fluid supply system for providing pressurized fluid to fluid actuated components on a refuse collection vehicle, said system comprising a fluid tank, a pump operatively connected to the crankshaft of the refuse vehicle engine for continuous operation, said pump having an inlet communicating with said tank, diversion means having an inlet communicating with the outlet of said pump and having an outlet selectively communicable with said tank and said fluid actuated components on said refuse collection vehicle, and means for increasing the idle speed of the engine to a predetermined actuation idle speed when the diversion means outlet is communicating with said fluid actuated components.

4,100,741

HOT-GAS ENGINE

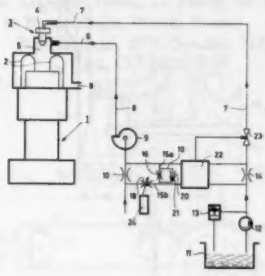
Albertus Peter Johannes Michels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,702

Claims priority, application Netherlands, Apr. 6, 1976, 7603554

Int. Cl.[2] F02G *1/06*

U.S. Cl. 60—517 3 Claims



1. A hot-gas engine, comprising at least one combustion chamber having connected to it at least one supply duct for combustion air, including a restriction, and at least one supply duct for fuel, the quantity of fuel to be supplied to the combustion chamber being controlled in proportion to the supplied quantity of combustion air by means of a control device which comprises a differential pressure sensor which communicates with the air supply duct upstream and downstream from the restriction, characterized in that upstream and downstream from the restriction a branch duct is connected to the air supply duct, said branch duct comprising a first duct portion which includes a first flow resistance element and a second duct portion which includes a second flow resistance element, the differential pressure sensor being connected to the first duct portion upstream and downstream from the first flow resistance element, the second flow resistance element being subject to control means which, by controlling the flow resistance in response to variations of ambient air temperature and pressure, correct the differential pressure to be sensed by the sensor for the said variations.

4,100,742

TURBOCOMPOUND ENGINE WITH TURBOCHARGER CONTROL

James L. Harp, Jr., Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

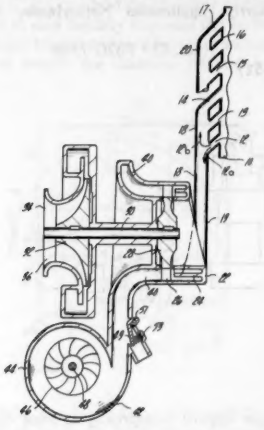
Filed Dec. 9, 1976, Ser. No. 748,975

Int. Cl.[2] F02D *23/00*

U.S. Cl. 60—602 1 Claim

1. An exhaust energy extraction system for an engine having two groups of cylinders, said system comprising plural manifolds, each receiving exhaust pressure pulses from one group of cylinders; the manifolds being connected to alternate-firing cylinders, whereby successive pulses are delivered to different manifolds; each manifold having a flow area approximately the same as the exhaust valve area for an individual engine cylinder whereby linear flow velocity of each pulse is maintained during transport thereof through the manifold; a first axial flow turbine having an inlet volute that is internally partitioned to define an inner annular volute section for directing gas onto the inner blade areas of the turbine rotor, and an outer annular volute section for directing gas onto the outer blade areas of the turbine rotor; the inlet volute being operatively located so

that its inner annular volute section is connected to one of the manifolds, and its outer annular volute section is connected to the other manifold; a second radial flow turbine receiving the total output from the axial flow turbine; a diffuser of gradually increasing flow area connecting the outlet of the axial flow turbine to the inlet of the radial flow turbine, whereby velocity pressure in the gas is converted to static pressure by the time the gas enters the rotor of the radial flow turbine; a pressure-



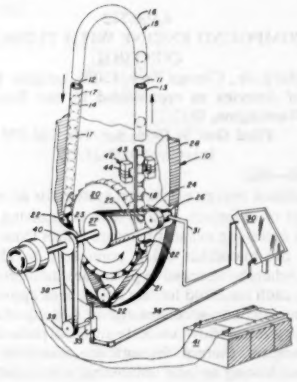
responsive vent valve controlled by pressures within the diffuser for venting gas from the system when the static pressure in the diffuser begins to exert a choking effect on pulse flow through the axial flow turbine; a centrifugal air compressor mechanically connected to the rotor of the axial flow turbine for air supercharging the engine; said radial flow turbine being mechanically connected to the output shaft of the engine to augment useful engine output.

4,100,743

GRAVITY ENGINE

Harold E. Trumbull; Howard C. Davis, both of Upper Arlington, and Robert A. Yano, Worthington, all of Ohio, assignors to The Northwestern Mutual Life Insurance Company, Milwaukee, Wis.

Filed Dec. 20, 1976, Ser. No. 752,674
Int. Cl.² F03G *3/02*
U.S. Cl. 60—639 **29 Claims**



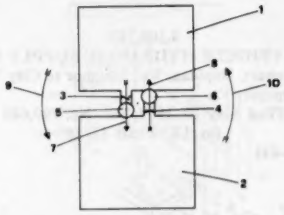
1. Energy conversion apparatus comprising a pair of generally adjacent vertical passageways, a plurality of bodies freely movable within said passageways, a fluid medium expander means at the bottom portion of a first of said passageways for imparting a force to successive ones of said bodies to accelerate them upwardly in said one passageway against the force of gravity, the magnitude of said force being great enough to cause successive ones of the bodies to reach the top of the first passageway, means at the top of said first passageway to direct said bodies to the top of the second of said passageways where they are stackes and permitted to descend by gravity in the second passageway, and means at the bottom of the second passageway for converting at least a portion of the potential energy of bodies falling in the second passageway to another form of energy while directing said bodies to the bottom of said first passageway where they are again accelerated upwardly by imparting a force thereto.

4,100,744

INSTALLATION FOR THE PRODUCTION OF ENERGY WHICH UTILIZES A SOURCE OF HEAT OR NATURAL THERMIC DIFFERENCES IN LEVEL

Delio De Munari, Via Dante 13, Quinto Vicentino (Vicenza), Italy

Filed Mar. 23, 1977, Ser. No. 780,476
Claims priority, application Italy, Dec. 10, 1976, 85622 A/76
Int. Cl.² F01K *25/10*
U.S. Cl. 60—651 **9 Claims**



1. An installation for the production of energy of the type which utilizes a source of heat or natural thermic differences which comprises two containers of suitable dimensions, the first container containing a fluid in the liquid state and being capable of transmitting the heat to said fluid, the second container being used for holding the fluid after completion of the thermodynamic cycle and after it has returned to the liquid state, a cooling source for cooling said second container, said second container being at a temperature and at a pressure lower than the temperature and the pressure which prevail in said first container, conduit means for connecting said first and second container, said fluid having a boiling point at one atmosphere lower than the minimum temperature of the cooling source in the location of the installation, said fluid being capable of undergoing a change from the liquid to gaseous state, and a device capable of utilizing the kinetic energy of the fluid and transforming said energy into mechanical energy, said device being placed in the conduit means between the first and the second container, said fluid being converted from the liquid to the gaseous state upon entry in said device and returning to the liquid state in the interior of said second container.

4,100,745
THERMAL POWER PLANT WITH COMPRESSED AIR STORAGE

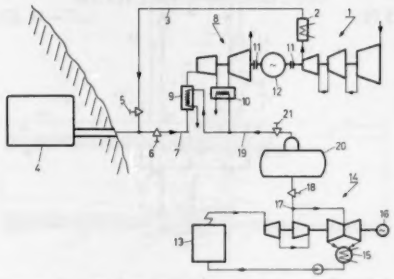
Georg Gyarmathy, Zollikon, and Hans Pfenninger, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 28, 1977, Ser. No. 763,336

Claims priority, application Switzerland, Mar. 15, 1976, 3165/76

Int. Cl.² F02C *1/04, 7/00*

U.S. Cl. 60—652 **13 Claims**



1. In a thermal power plant of the type which produces compressed air by use of excess energy generated during off-peak load periods and which is accumulated in a storage tank, the stored compressed air being withdrawn from said tank and delivered to a hot-air turbine through a compressed air line extending from said storage tank to said hot-air turbine during peak load periods for generation of additional energy, the improvement comprising:

a heat exchanger included in said compressed air line;

a steam turbine for producing bleeder steam; and,

means for supplying said bleeder steam to said heat exchanger for heating said compressed air prior to delivery to said hot-air turbine.

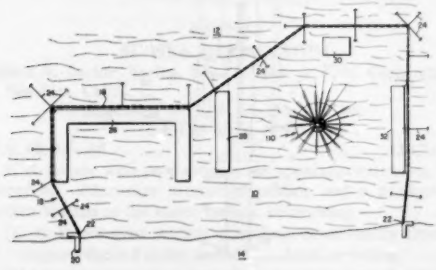
4,100,746
PROTECTED AQUATIC SPORTS AREA

Paul Preus, 21 Smith Rd., Toms River, N.J. 08753

Filed Jun. 13, 1977, Ser. No. 805,981

Int. Cl.² E02B *15/04;* **E04H** *3/16*

U.S. Cl. 61—1 F **5 Claims**



1. An isolated and protected aquatic sports zone in a portion of a larger shore-bounded body of water comprising a pair of spaced pier bulkheads defining the length of the protected zone along the shore of the body of water, a plurality of water impervious boom sections, each of said boom sections including a generally tubular flotation element and an integral water impervious depending skirt, each tubular element having an upstanding fin and hand grips spaced along said fin, each depending skirt having ballasting means along the lower edge thereof and means connecting each tubular element and depending skirt in end-to-end relation, means connecting the ends of the connected boom sections to said pair of spaced pier bulkheads, a second skirt member, means releasably connecting the top of the second skirt member to the top of the flotation elements, further means releasably connecting the lower end of the integral skirt to said second skirt, said second skirt having a length greater than the depth of the water at the point of deployment and ballasting means carried at the lower end of said second skirt, anchor means, and means attaching the anchor means to the boom sections at spaced intervals to thereby define a fixed protected aquatic sports zone.

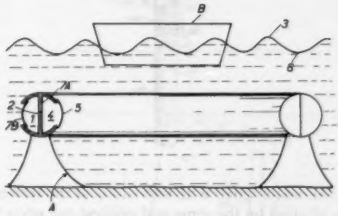
4,100,747
SWELL ABATEMENT DEVICE

Pierre Jean Alphonse Facon, Le Perray en Yvelines, France, assignor to Bertin & Cie, Plaisir, France

Filed Aug. 10, 1976, Ser. No. 713,230

Int. Cl.² E02B *3/06*

U.S. Cl. 61—5 **3 Claims**



1. Swell abatement device for establishing a relatively quiescent zone on an agitated water surface, by means of a swell damper responsive to variations in water level between the crest and the trough of waves, said damper comprising:

completely submerged first and second enclosures both extending entirely within the liquid mass, i.e., under the minimum datum level defined by the trough of the waves,

first one-way flow orifice means on said first enclosure arranged for the in-flow of water into said first enclosure upon external overpressure,

second one-way flow orifice means on said second enclosure arranged for the out-flow of water from said second enclosure, and

hydraulic energy dissipating passage means connecting said first enclosure with said second enclosure.

4,100,748
MINE ROOF OR ROCK BOLT EXPANSION ANCHOR OF THE BAIL TYPE

Roger M. Hansen, Birmingham, Ala., assignor to Stratabolt Corporation, Pelham, Ala.

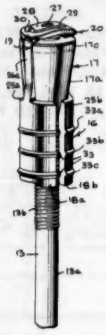
Filed Jan. 7, 1977, Ser. No. 760,452

Int. Cl.² E21D *21/00;* **F16B** *13/04*

U.S. Cl. 61—45 B **15 Claims**

1. An expansion anchor for mine roofs and the like comprising an expansible shell formed from an integral unitary blank of sheet metal having a pair of initially substantially rectangular leaves interconnected to each other at proximal ends thereof by a bail strap and free at the other ends thereof, said bail strap being bent to a U-shape and said leaves being bent to semi-cylindrical shape concentric with a bolt axis with their side edges in mutual abutment defining a generally cylindrical exterior for engagement with the walls of a mine ceiling bore, said bail strap having an enlarged circular top portion midway along its length and straight narrow leg portions extending in parallelism therefrom to said proximal ends of the leaves, an expander cone nut having an internally threaded bore and located in confined relation between said leaves and between said leg portions and having a generally frusto conical outer

surface convergently tapering to a smaller diameter end interposed between said leaves to abut the leaves and spread them outwardly, a bolt threaded through the cone nut for moving the nut downwardly in the shell and bring progressively larger diameter portions of said outer surface against the leaves for spreading the leaves outwardly, said circular top portion of the bail having an pop-out center formed by a pair of substantially semicircular arcuate cuts therethrough defining a concentric circle interrupted by a pair of frangible uncut attachment sections, said pop-out center being of slightly larger diameter



than the bolt and aligned with and adjacent the free end of the bolt to be abutted by the same and popped out upon predetermined rotation of the bolt and form an aperture for passage of the bolt through said top portion, and said circular top portion of said bail strap including said pop-out center and the remaining encircling portion being shaped in an upwardly convex cylindrical path having its axis of revolution passing through the bolt and with the uncut attachment sections arranged along a diametric axis paralleling the axis of revolution of said cylindrical path to facilitate centering of the bolt relative to the circular top portion upon engagement thereof.

4,100,749

METHOD AND DEVICE FOR LINING CHAMBERS AND GALLERIES

Gerd Radner, Herne; Christoph Zillessen, Recklinghausen; Walter Zywietz, Dortmund; Franz Gantke, Dortmund-Kirchderne, and Harald Walter, Dortmund, all of Germany, assignors to Runkohle, A. G. Essen, Germany

Filed May 9, 1977, Ser. No. 795,348

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621361

Int. Cl.[2] E21D *11/22*

U.S. Cl. 61—45 C **27 Claims**

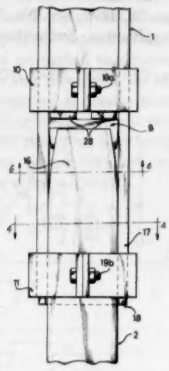
1. A method for lining chambers and galleries, especially mining and tunnelling galleries, with a deformable frame including first and second segments having end portions, one of which is capable of being slid into another for joinder, said segments having a generally C-shaped cross section with a pair of arms joined by an intermediate connection member having an exterior flange, said method comprising the steps of:

altering the cross-sectional configuration of the end portion of at least one of the segments for permitting sliding joinder of said second segment into said first segment;

inserting the end portion of the second segment into the end portion of the first segment with the C-shaped sections of the segments opening in opposite directions to form a closed tube in the region of the overlapped end portions;

positioning a wedge means in operative association with the overlapped end portion of at least the second segment for placing the overlapped end portions of said first and second segments in frictional engagement and to establish, at least in part, a predetermined resistance to further insertion of the second segment into the first segment;

placing the arms of the first segment in abutment with the sides of the flange of the connecting member of the second segment; and



peripherally compressing the first and second segments, at least adjacent to the area of frictional engagement of said end portions, to further establish the predetermined insertion resistance.

4,100,750

METHOD FOR THE PRODUCTION OF PILES CAST IN THE GROUND AND HOLLOW AUGER FOR IMPLEMENTING THE METHOD

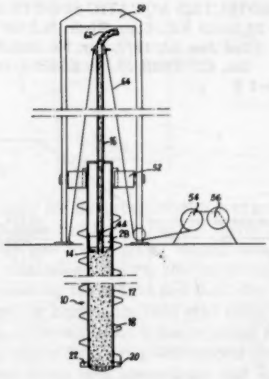
Jean-Marie Labrue, 31, rue Gustave-Gaillard, 33 Saint-Medard-en-Jalles, France

Filed Jul. 12, 1976, Ser. No. 704,403

Claims priority, application France, Jul. 17, 1975, 75 22328

Int. Cl.[2] E02D *5/34*

U.S. Cl. 61—53.64 **3 Claims**



1. Method for producing piles cast in the ground, according to which a hole is drilled in the ground by means of a hollow auger and the auger is then raised progressively from the drill-hole whilst simultaneously injecting concrete under pressure into the hole thus obtained, characterized in that an auger is used provided with a blade support tube and a removable cutting head which is able to slide in a sealed manner in the blade support tube of the auger, and in that the injection of concrete takes place through a central passageway provided in the cutting head, which is undertaken in two successive stages, comprising a first stage in which concrete is injected into the

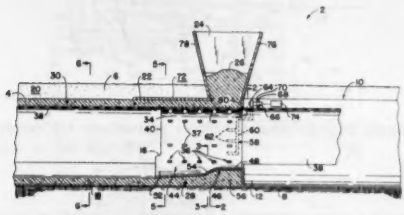
support tube by progressively raising the cutting head to a predetermined level, namely zero level in the latter, and a second stage in which the auger is raised from the drill-hole by exerting a constant pressure on the cutting head and whilst injecting concrete in order to maintain this head at the predetermined level.

4,100,751

CONTINUOUS CONCRETE PIPE LAYING MACHINE

Larry V. Thomason, 4196 E. Herndon, Clovis, Calif. 93612

Filed Jan. 31, 1977, Ser. No. 764,118
Int. Cl.² F16L *1/02*; E02D *29/10*
U.S. Cl. 61—72.2 **27 Claims**



1. Apparatus for forming a continuous length of concrete pipe in an open trench by pouring fresh concrete and giving it a tubular shape before it hardens, the apparatus comprising: sled means having forward and aft ends for movement through the trench in a forward direction; interior mold means connected to the sled for pouring fresh concrete thereabout and forming an interior surface of the pipe, the interior mold means being positioned aft of the sled means so that a space is formed between a lower portion of the mold means and a bottom portion of the trench, the space for defining a wall thickness for a lower portion of the pipe; exterior mold means connected to the sled means for shaping an exterior surface of the pipe not in contact with and supporting by walls of the trench; a member reciprocably mounted to the interior mold means for continuously compressing and consolidating freshly poured concrete disposed in the space as the sled means is drawn through the trench and the mold means shapes the pipe; and means for reciprocating the member at a relatively low rate which is insufficient to loosen dirt and sand in the trench or to cause vibrations of the mold means.

4,100,752

SUBSEA RISER SYSTEM

Albert R. Tucker, Spring, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 15, 1976, Ser. No. 723,380
Int. Cl.² E02B *17/00*
U.S. Cl. 61—86 **13 Claims**

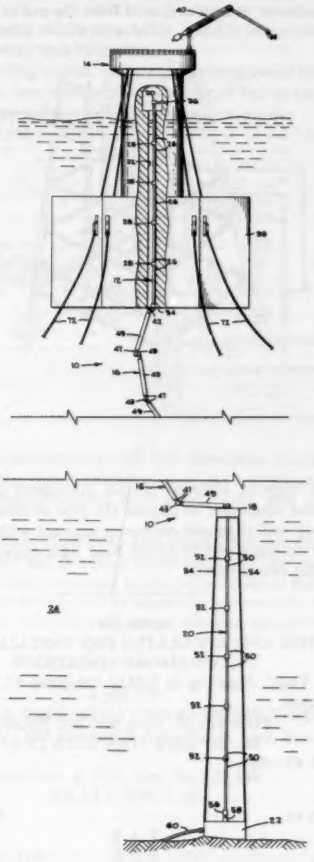
1. A subsea well production riser apparatus extending between an underwater production station and a production station located at the water surface, comprising

(a) an upper riser section extending downwardly from a support thereof at the surface production station,

(b) a lower riser section extending upwardly from the underwater production station to a submerged support for said lower section, said lower section being supported in tension with respect to said underwater station,

(c) a middle riser section intermediate said upper and lower riser sections and interconnecting said two riser sections to establish a fluid flow conduit therewith, said middle riser section being flexible to accommodate movement of the surface production station with respect to the underwater station, and

(d) a submerged platform means intermediate said surface production station and said underwater station, said submerged platform means being secured to an underwater



foundation by means other than said lower riser section and having positive buoyancy.

4,100,753

MARINE STRUCTURE WITH RISER CONDUCTOR AND PIPELINE CONNECTION

George E. Mott, Metairie, and Ronald D. Seguin, New Orleans, both of La., assignors to Texaco Inc., New York, N.Y.

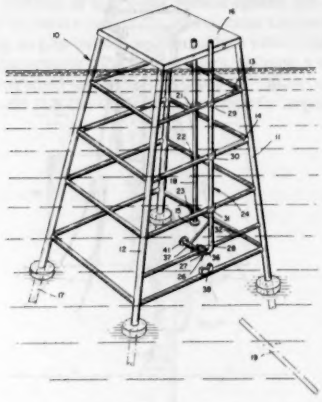
Filed Feb. 10, 1977, Ser. No. 767,401
Int. Cl.² E02B *17/00*
U.S. Cl. 61—86 **9 Claims**

1. A marine structure having upper and lower ends, for use in an offshore body of water, being adapted to engage a fluid carrying pipeline supported at the ocean floor, said marine structure including at least one upstanding support column having upper and lower ends, and a deck carried at the upper end of said at least one support column,

a fluid conductor operably depending from said at least one support column having one end disposed at said deck, and a coupling end disposed adjacent to the marine structure's lower end, said fluid conductor being longitudinally slidable to a limited degree, along said at least one support column,

an elongated provisional conductor comprising; a pipe section releasably disposed adjacent to said fluid conductor, prior to being connected with said pipeline and a connect-

ing segment depending from and forming an adjunct to said pipe section at the marine structure's lower end, operably connecting said structure with said provisional conductor at a point spaced from the end of said connect-



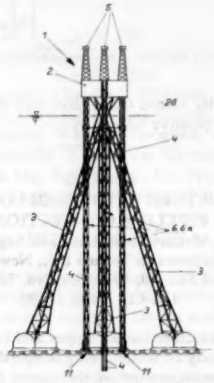
ing segment whereby pivotal movement of said provisional conductor to dispose the pipe section at the ocean floor, will align said connector segment with said conductor coupling end to permit fluid tight engagement of the latter two members.

4,100,754

METHOD AND APPARATUS FOR INSTALLING PIPES IN OFF-SHORE LOCATIONS

Rudolf Vogel, Jägerweg 6, D3320 Salzgitter 51, Fed. Rep. of Germany

Filed Jul. 28, 1976, Ser. No. 709,302
Int. Cl.[2] E02B *17/00;* **E21B** *15/02*
U.S. Cl. 61—98 **15 Claims**



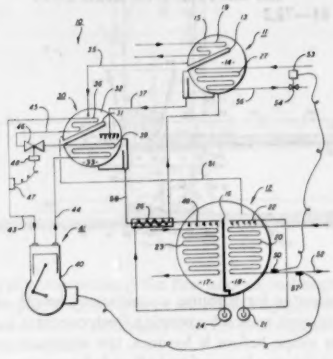
1. In an off-shore installation for extracting fluids from the sea bed and including a platform into the sea bed and operable to conduct the fluid from the point of extraction thereof from the sea bed to the platform, the improvement in combination therewith which comprises; at least two pipes in parallel coextensive relation forming a group, and members connecting the pipes of the group together as a complete bundle fabricated on-shore to form a unitary assembly or pipe package effective for transport and installation off-shore, said connecting members including sleeve portions surrounding the pies of the respective group, the pipes being axially movable in said sleeve portions, and means for locking the pipes to the respective sleeve portions.

4,100,755

ABSORPTION REFRIGERATION SYSTEM UTILIZING SOLAR ENERGY

Louis H. Leonard, DeWitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,034
Int. Cl.[2] F25B *27/00, 15/00, 27/02*
U.S. Cl. 62—2 **18 Claims**



1. In an absorption refrigeration system having a primary generator for processing an absorptive solution therein and a primary condenser for condensing refrigerant therein, the improvement comprising

a secondary generator operatively connected to the primary generator to receive processed solution from the primary generator,

a secondary condenser operatively connected to said primary condenser to receive refrigerant condensate therefrom, and

a compression driven refrigeration circuit having a first heat exchanger in heat transfer relation with the refrigerant contained in the secondary condenser and a second heat exchanger in heat transfer relationship with the solution contained within the secondary generator whereby the heat of condensation developed in the secondary condenser is transferred into the secondary generator.

4,100,756

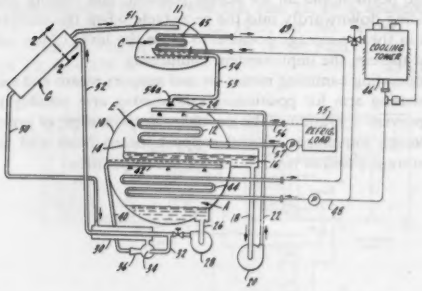
SOLAR POWERED ABSORPTION REFRIGERATION SYSTEM

Clarence Elmo Albertson, Villa Park, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 29, 1976, Ser. No. 755,329
Int. Cl.[2] F25B *27/00, 15/00;* **F24J** *3/02;* **62** *2;148;324;476*
U.S. Cl. 62—2 **3 Claims**

1. An absorption refrigeration system comprising: an evaporator, an absorber, a generator and a condenser all connected in a closed, continuous cycle referigeration circuit with relatively concentrated absorbent solution flowing to the absorber to absorb water vapor from the evaporator and relatively dilute absorbent solution flowing from the absorber to the generator to be concentrated with concomitant release of water vapor to be conducted to the condenser, said generator including a solar collector for providing thermal energy to the absorbent solution to be concentrated, said solar collector including a series of inclined channels into which said relatively dilute solution is introduced in such a way that the channels are not completely filled with solution and a vapor space is maintained at the upper portion thereof, the exterior

surface of said channels being provided with a solar absorbing surface; means for directing water vapor to said condenser;



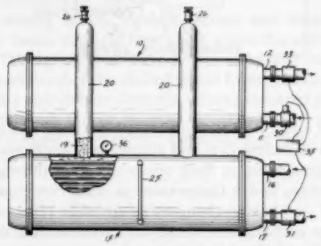
and means for conducting relatively concentrated absorbent solution to said absorber.

4,100,757

CLOSED CIRCUIT AMMONIA SYSTEM FOR LIQUID HEATING FROM WATER

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed May 4, 1977, Ser. No. 793,651
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—52 **4 Claims**



1. Apparatus for raising the temperature of a liquefied gas which is at a temperature substantially below the freezing point of water, comprising first and second enclosed vessels, the first mounted at a higher elevation than the second, first conduit means connecting the upper portion of the second vessel to the upper portion of the first vessel for the flow of vapor from the second vessel to the first vessel, second conduit means connecting the lower portion of the first vessel to the lower portion of the second vessel for the flow of condensed liquid from the first vessel to the second vessel, first tube means for passing liquefied gas into and out of said first vessel, second tube means for passing a heating liquid into and out of said second vessel, valve means for controlling the flow through said first tube means, temperature responsive means for sensing the temperature of the heating liquid flowing out of said second vessel, and control means responsive to said temperature responsive means for operating the valve means of said first tube means.

4,100,758

VACUUM ASSIST FUEL SYSTEM

Edward A. Mayer, Newburgh, N.Y., assignor to Texaco Inc., New York, N.Y.

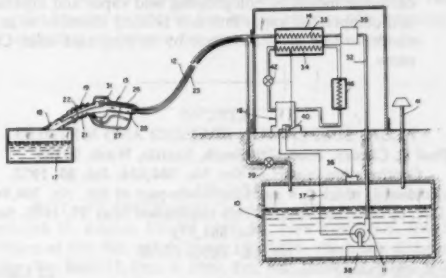
Filed Nov. 19, 1976, Ser. No. 743,248
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—54 **7 Claims**

1. In a system for conducting a vaporizable fuel from a storage facility therefor, into a receiving tank having an inlet port, and for concurrently conducting a vaporous stream from said receiving tank to said storage facility, which system includes;

a fuel dispensing nozzle detachably, sealably connected with said receiving tank inlet port,

a liquid pumping circuit, including pumping means having a pump inlet communicated to a source of fuel in said storage facility, and having a discharge port,

and an elongated conductor including a liquid carrying



conduit communicating said fuel dispensing nozzle with said pumping means discharge port, and a vapor carrying conduit communicating said nozzle with said storage facility,

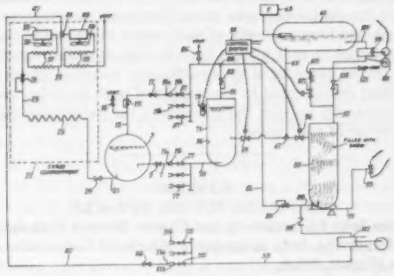
the improvement therein of a heat transfer member disposed intermediate said pumping means discharge port and said liquid carrying conductor to receive a stream of fuel from said storage facility and to adjust the temperature of said fuel stream prior to said stream entering said receiving tank.

4,100,759

CO_2 VEHICLE REFRIGERATION SUPPORT SYSTEMS

Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521

Filed Nov. 1, 1976, Ser. No. 737,439
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—55 **10 Claims**



1. A method for filling vehicle tanks with low pressure liquid carbon dioxide and for providing standby cooling of the cargo compartments of said vehicles, which method comprises

supplying a holding chamber with liquid CO_2 from a high pressure liquid CO_2 storage vessel system,

reducing the pressure of said liquid CO_2 to about 60 p.s.i.g. or below to create CO_2 vapor and CO_2 snow thereby forming a low-temperature coolant reservoir of CO_2 snow in said holding chamber,

removing and compressing said CO_2 vapor from said holding chamber and returning said compressed CO_2 vapor to said storage vessel system,

supplying liquid CO_2 from said high pressure storage vessel system to the vehicle tank at a pressure below about 125 psig and condensing the vapor created as a result of the

formation of said lower pressure liquid by melting said CO_2 snow in said holding chamber,

flowing liquid CO_2 from said vehicle tank through heat exchange means in the cargo compartment and vaporizing said liquid therein to cool the cargo compartment,

expanding said vapor from said heat exchange means to lower the temperature thereof,

passing said expanded vapor through additional heat exchange means in the cargo compartment, and

recovering said expanded vapor from said additional heat exchange means by compressing said vapor and injecting said compressed vapor into said holding chamber so as to condense said injected vapor by melting said solid CO_2 snow.

4,100,760

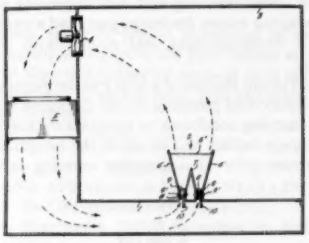
FLUID SUSPENSION FREEZER AND METHOD

Paul L. Cheney, 4104-12th South, Seattle, Wash. 98108

Continuation-in-part of Ser. No. 384,034, Jul. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 204,940, Dec. 6, 1971, abandoned. This application May 27, 1975, Ser. No. 581,372

Int. Cl.² F25D *17/00*

U.S. Cl. 62—57 **22 Claims**



1. Treating apparatus comprising a trough, at least a portion of said trough flaring upwardly and the walls of a portion of the trough below said upwardly flaring portion are steeper than the walls of said upwardly flaring portion, means for supplying to said trough particulate material to be treated, and means for supplying gas to said trough moving upward through and longitudinally of said trough through the particulate material in said trough for exerting dynamic supporting force on the particles of such particulate material, which force is at least nearly equal to the weight of such particles, and for simultaneously moving the particles of the particulate material lengthwise of said trough.

4,100,761

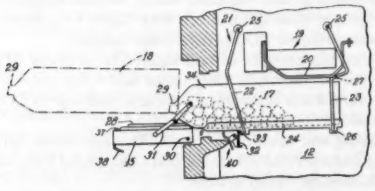
MOVABLE ICE RECEPTACLE

William John Linstromberg, and Charles Thomas Rutledge, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 10, 1976, Ser. No. 749,537

Int. Cl.² F25C *1/00*

U.S. Cl. 62—137 **12 Claims**



1. In a refrigeration appliance having a cabinet defining a freezing space, an ice maker located within said freezing space, a sensing arm for controlling operation of said ice maker, an ice collecting receptacle, and support means for carrying said receptacle within said space for movement between an ice storage position and an ice access position, said sensing arm extending downwardly into the receptacle when the receptacle is in the ice storage position to sense the level of ice collected therein, the improvement comprising

cooperating camming means on said support means and said sensing arm for positioning said sensing arm suitably to prevent operation of the ice maker as an incident of preselected movement of said support means from said ice storage position toward the ice access position.

4,100,762

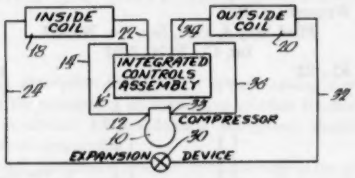
INTEGRATED CONTROLS ASSEMBLY

Gerald L. Davis, and Timothy C. Scott, both of Bristol, Va., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 2, 1976, Ser. No. 737,990

Int. Cl.² F25B *13/00, 47/00, 43/00*

U.S. Cl. 62—160 **20 Claims**



1. An integrated controls assembly for use in a heat pump or the like including first and second heat exchangers, said heat exchangers being in fluid communication through an expansion device, and a compressor in fluid communication with each of said heat exchangers to circulate refrigerant through said heat exchangers and said expansion device, the integrated controls assembly comprising:

(a) an accumulator communicating with each of said heat exchangers and with the discharge outlet and suction inlet of said compressor;

(b) a first conduit leading from the discharge outlet of said compressor with a section of said conduit being within said accumulator;

(c) second and third conduits placing said accumulator in communication with said first and said second heat exchangers, respectively;

(d) a reversing valve assembly within said accumulator and placing said first conduit in selective communication with either said second conduit or said third conduit and placing the conduit not communicating with the first conduit in communication with the interior of said accumulator;

(e) a bypass valve associated with said first conduit to place said first conduit in fluid communication with the interior of said accumulator in response to heat;

(f) an oil conduit communicating with the lowermost section of said tank; and

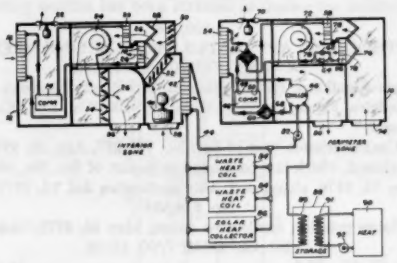
(g) a combination aspirator/check valve having a gas inlet within said accumulator and connected to said oil conduit and a fourth conduit leading to the suction inlet of the compressor for the simultaneous return of oil and gaseous refrigerant from the interior of said accumulator to the said suction inlet by the gas flow creating a partial vacuum to draw oil through the oil conduit for return with the gas to said suction inlet of the compressor.

4,100,763

MULTI-SOURCE HEAT PUMP HVAC SYSTEM

Herbert M. Brody, Cherry Hill, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 698,233, Jun. 21, 1976, abandoned.
This application Apr. 22, 1977, Ser. No. 789,903
Int. Cl.[2] F25B *27/02, 27/00, 13/00;* F25D *17/06*
U.S. Cl. 62—238 25 Claims



17. In an air-conditioning system of the type adapted to provide fresh uncooled air to a zone to be conditioned and including means for removing warm zone air from the conditioned zone and exhausting at least a portion of the removed warm zone air to the atmosphere, the improvement comprising:

a waste heat recovery means disposed in the path of the exhausted warm zone air for recovering heat therefrom;

heat pump means for chilling a liquid and extracting usable heat therefrom; and

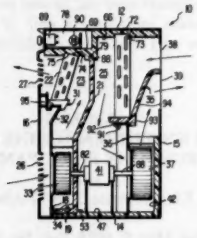
liquid circulating means interconnecting said waste heat recovery means and said heat pump means for circulating a liquid through said heat recovery means and said heat pump means so that the chilled liquid from the heat pump means may absorb heat from the warm exhausted zone air passing through the waste heat recovery means and the heat pump means may extract the heat from said circulating liquid.

4,100,764

AIR-CONDITIONING APPARATUS

Mitsuo Murano, Fujinomiya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 29, 1977, Ser. No. 792,343
Claims priority, application Japan, Apr. 30, 1976, 51-49700; Jun. 29, 1976, 51-76940
Int. Cl.[2] F25D *21/14, 23/12, 19/00*
U.S. Cl. 62—289 16 Claims



1. An air conditioning apparatus comprising:

a cabinet structure consisting of bottom, right side, left side, top, front and rear walls;

a refrigeration system arranged in said cabinet structure;

an insulation structure made of foamed plastic insulating material consisting of bottom, right side, left side and top insulation boards for thermally insulating said cabinet structure, each of which is in a closely mating relationship with said corresponding wall and each having catch means therewith for interconnecting adjoining insulation boards together and for fixedly disposing therebetween components of said refrigeration system, when assembled; and

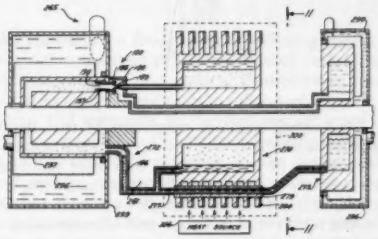
a partition member made of the same material as that of said insulating structure, with its bottom, right, left and top sides firmly and fixedly positioned by said catch means of said insulating structure for dividing the cabinet interior into an interior compartment, including an interior fan case housing an interior fan, and an exterior compartment, including an exterior fan case housing an exterior fan.

4,100,765

ROTARY THERMODYNAMIC APPARATUS

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Division of Ser. No. 461,452, Apr. 16, 1974, which is a division of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828, which is a continuation-in-part of Ser. No. 608,323, Jan. 10, 1967, Pat. No. 3,470,704. This application Sep. 16, 1976, Ser. No. 723,714
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—499 7 Claims



1. Thermodynamic apparatus comprising, in combination, a rotor means for rotating said rotor, conduit means in said rotor having a first section for guiding the flow of fluid radially outwardly from the axis of rotation of said rotor, and a second section connected to said first section at a location spaced radially outwardly from said axis for guiding the flow of fluid back towards said axis, further conduit means joining said first and second conduit sections to conduct a fluid therebetween at a second location which is spaced inwardly towards said axis from said first location, means for creating a continuous difference between the average density of a first volume element of fluid in said first section and a second volume element of fluid in said second section comprising heat exchange means for introducing heat into said fluid at one location and for permitting heat to flow therefrom at another location; said first and second volume elements being equal and being located at equal average radial distances from said axis, and means connected to said conduit means for pressurizing and then expanding the fluid, said means for rotating said rotor comprising a source of pressurized gas, nozzle means connected to said source and directed at said rotor to create a tangential gas flow component impinging upon said rotor.

5. In a rotary thermodynamic device including a rotor containing fluid flow conduit means, means in said rotor actuated by a flow of heat from a lower temperature source to a higher temperature source for developing a fluid stream, reaction means in said rotor having a surface relatively stationary with respect to the environment of said rotor, and means for directing said stream against said surface to rotate said rotor.

4,100,766

FLAT KNITTING MACHINE HAVING FOUR OPPOSED NEEDLE BEDS

Gottfried Kuhnert, Aalen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Postfach, Germany

Continuation-in-part of Ser. No. 599,436, Jul. 28, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,382
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1974, 2436450
Int. Cl.[2] D04B 7/04
U.S. Cl. 66—64 1 Claim

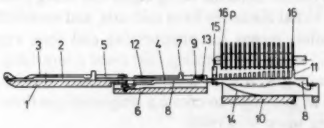
1. A flat knitting machine comprised of two flat V-bed knitting machines each having two opposed needle beds alternately arranged to provide front and back main beds and front and back auxiliary beds located above the main beds, wherein each of said beds are the same length each main bed and the auxiliary bed which faces it from a pair of cooperating needle beds, and single carriage means arranged to transverse the entire length of all the needle beds and including cam means for imparting knitting and loop transferring motions to the needles on both the main beds and both the auxiliary beds, said cam means comprising two transfer cams operable in both directions of traverse as a leading and trailing transfer cam and a double stitch cam system interposed between them.

4,100,767

KNITTING MACHINE PATTERN MECHANISM

Hans Schieber, Bopfingen, and Reinhold Schimko, Aalen-Wasseralfingen, both of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Oct. 12, 1977, Ser. No. 841,420
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646410
Int. Cl.[2] D04B 7/00
U.S. Cl. 66—75.2 21 Claims



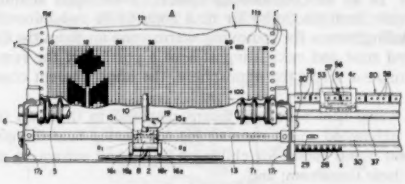
1. A knitting machine pattern mechanism comprising a needle support means, a plurality of needle control means movably carried by said needle support means, butt means on each of said needle control means, said butt means being in staggered formation, cam means movable relative to said needle support means, a plurality of control members for selectively determining the positions of said needle control means, means mounting said control members for movement relative to the needle support means between two of said butt means positioned successively in the direction of cam movement, and means operative to mechanically move said control members to and retain said control members in selected positions appropriate to a particular pattern.

4,100,768

METHOD AND APPARATUS OF SELECTING NEEDLES OF A KNITTING MACHINE

Shigeo Kamikura; Hideaki Itagaki, and Ryoiti Kawaoka, all of Kodaira, Japan, assignors to Silver Seiko Co., Ltd., Kodaira, Japan

Continuation-in-part of Ser. No. 789,287, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 686,380, May 14, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,534
Claims priority, application Japan, May 24, 1975, 50-61480
Int. Cl.[2] D04B 7/00, 15/66
U.S. Cl. 66—75.2 21 Claims



12. A patterning system in a straight knitting machine having a main body provided thereon with a needle bed for knitting needles and a carriage slidably mounted on said needle bed, comprising, in combination, needle selection means including an electromagnet for selectively operating said knitting needles,

input means for providing control signals, and

control circuit means for selective energization of said electromagnet and electrically connected to said input means, said control circuit means including a program memory having therein signals representative of data for needle selection at least for a course of knitting, said control circuit means further including read-out means for reading said signals out of said program memory in response to said control signals provided by said input means, said input means including a defining means for defining a range in which needle selection is to be effective in accordance with signals read out of said program memory, said defining means including a pair of boundary members mounted on and manually displaceable relative to said needle bed.

4,100,769

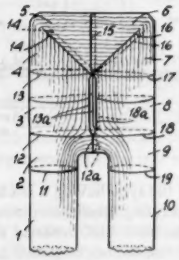
CIRCULAR KNITTING MACHINE METHOD FOR MANUFACTURING ONE PIECE PANTY HOSE OR THE LIKE

Siegfried Nürk, Körnerstrasse 5, 7470 Albstadt 3, Fed. Rep. of Germany

Filed May 5, 1976, Ser. No. 683,429
Claims priority, application Italy, Jan. 15, 1976, 19300/76
Int. Cl.[2] A41B 9/14; D04B 1/00
U.S. Cl. 66—177 3 Claims

1. A method for manufacturing panty hose or like fabrics on a circular knitting machine having at least one needle cylinder, comprising knitting a first leg portion with continuous rotary motion of said at least one cylinder and with all the needles operating, simultaneously inactivating a certain number of needles and causing them to hold the fabric on termination of

said leg portion, knitting with the remaining needles by reciprocating said at least one needle cylinder a first part of constant width consisting of a number of partial courses defining a selvedge at their ends, progressively reducing the operating needles by progressively inactivating needles on the two sides of the group of operating needles and causing said progressively inactivated needles to hold the fabric, progressively increasing the operating needles by progressively activating said progressively inactivated needles until the same number of operating needles has been attained as during the knitting of



said first part, further progressively reducing and further progressively increasing the operating needles as during said progressively reducing step and said progressively increasing step, knitting a second part of constant width extending substantially over the same number of courses as said first part, simultaneously activating all the needles causing said at least one needle cylinder to pass into continuous rotary motion and knitting a second leg portion with all the needles, cutting the central part of the fabric to define a waist opening, and sewing said two parts of constant width at the selvedges on the two sides over the entire height of said parts.

4,100,770

PROCESS AND NONRAVELING KNIT TUBULAR PRODUCTS HAVING AXIAL STRETCH

Simone Charles Titone, Birchrunville, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1976, Ser. No. 736,459

Int. Cl.[2] D04B *23/06, 23/02, 23/12*

U.S. Cl. 66—193 **5 Claims**

2. A ravel resistant warp knit fabric comprising

a. wales, each comprising a plurality of ends of elastomer yarn and consisting essentially of (i) a succession of at least 4 chain stitches of one of said ends of elastomer yarn alternating with a succession of at least 4 chain stitches of at least one other of said ends of said elastomer yarn, each of said chain stitches consisting essentially of only a single end of said elastomer yarn, and (ii) portions of each said one and said other ends of elastomer yarn laid into the succession of chain stitches of said other and said one ends of elastomer yarn, respectively, and

b. inelastic yarn interconnecting said wales together to form said fabric, said fabric having at least 20,000 denier of said elastomer yarn per cm of fabric width.

4,100,771

METHOD AND APPARATUS FOR FLEXIBILIZING LEATHER

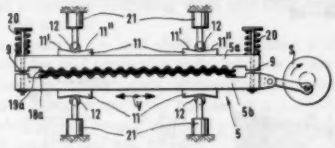
Jiri Dokoupil, Hochstrasse 9, D-6251 Gückingen, of Germany

Filed Sep. 20, 1976, Ser. No. 724,771

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543412

Int. Cl.[2] C14B *1/40*

U.S. Cl. 69—33 **24 Claims**



5. An apparatus for flexibilizing or softening leather or the like material, comprising at least two spaced tools for entraining an area section of said material therebetween, means for moving at least one of said tools in a direction opposite to said other tool and transverse to the direction of travel of said material for imposing an alternating deformation on a piece of said material, said tools extending at least partially over the piece of material and arranged at a mutual spacing from one another in a direction substantially parallel to the plane of the piece of material, said moving means imparting a path of travel to said tools comprising at least in one section thereof a component directed essentially parallel to the plane of the piece of material, said moving tools imparting at least shearing forces to said material essentially parallel to the plane of said material to cause flexibilizing deformation of said material being entrained by said tools.

4,100,772

CONTINUOUS LEATHER PROCESSING MACHINE

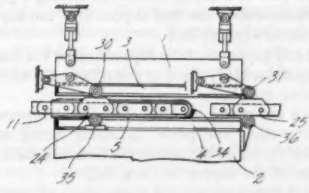
Heinz Dennstädt, Oberusel, and Walter Baum, Frankfurt, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Oct. 27, 1977, Ser. No. 846,028

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650576

Int. Cl.[2] C14B *17/00*

U.S. Cl. 69—47 **13 Claims**



1. A machine for the continuous processing of hides, comprising:

a table board guided longitudinally through an arrangement

of processing tools disposed opposite each other, wherein each hide is disposed approximately in the middle thereof around the front edge of said table board;

means for displacing said hide with respect to said table board to permit the middle strip of hide which covered the front edge of said table board to be displaced for processing thereof;

said processing tools include a first processing tool and a second processing tool;

said second tool being in contact with said hide for a period of time to effectuate said displacement of said hide with respect to said table board, by at least the width of the front edge of the table board.

4,100,773

DRYING PRESS FOR HIDES

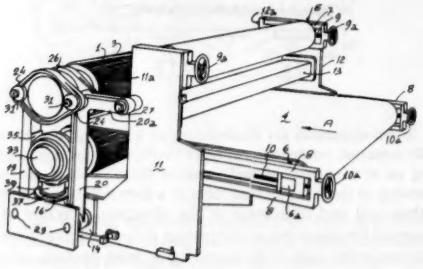
Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Filed Aug. 16, 1976, Ser. No. 714,755

Claims priority, application Italy, Sep. 3, 1975, 26874 A/75

Int. Cl.[2] C14B *1/30;* **B30B** *9/24*

U.S. Cl. 69—48 **5 Claims**



1. An endless belt press comprising

(a) an upper endless belt and a lower endless belt cooperating with the upper belt,

(b) a belt support roller and a belt tensioning roller for each of the belts, the endless belts being trained over the support and tensioning rollers therefor,

(1) the support rollers, with the belts trained thereover, defining a press nip therebetween,

(c) a pair of end supports for each of the support rollers,

(d) a pair of thrust means, a respective one of the end supports of the support roller for the lower belt resting on a respective one of the thrust means and the thrust means being arranged to exert a thrust against the support roller for the lower belt for displacing the same towards the support roller for the upper belt,

(e) two pairs of like bracing members,

(1) the bracing members of each pair having one end pivoted to a respective one of the thrust means for pivoting in a plane substantially perpendicular to the axes of the support rollers,

(2) each pair of bracing members defining a guide for the displacement of the end supports of the support roller for the lower belt and

(3) the end supports of the support roller for the upper belt being detachably fixed to the other ends of each pair of bracing members,

(f) a pivot mounting for one of the end supports of each support roller, the pivot mounting being arranged to permit pivoting of the support rollers in a plane defined by the axes of the support rollers, and

(g) traction means connected to the one end support of each support roller for pivoting the support rollers on the pivot mounting whereby the other end supports thereof are raised and the raised end support of the support roller for the lower belt no longer rests on the thrust means.

4,100,774

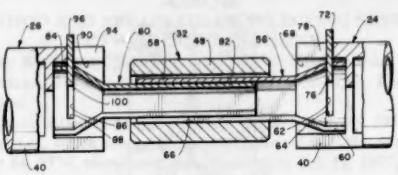
LOCKSET HAVING IMPROVED TORQUE BLADE CONSTRUCTION

Paul G. Solovieff, Tustin, and Robert E. Cyran, Anaheim, both of Calif., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed May 18, 1977, Ser. No. 798,182

Int. Cl.[2] E05B *17/04*

U.S. Cl. 70—380 **25 Claims**



1. In a lockset of the type having a latch bolt operably connected to a latch operating mechanism mountable in a door for reciprocation of the latch bolt between door edge extended and retracted positions, the latch operating mechanism having a crank hub partially oppositely rotatable for reciprocally moving said latch bolt, first and second actuators mounted at opposite faces of the door operably connected to the crank hub selectively operable for producing said crank hub partial rotations and said latch bolt reciprocations; the improvement comprising: a tubular female torque blade operably connected at an outer end to said first actuator partially rotatable thereby, said female torque blade having an inner end axially slideably positioned in an axial opening through said crank hub, said female torque blade including engagement means at least at said inner end automatically operable between said inner end and crank hub upon said slideable positioning positively requiring preset single position relative circumferential positioning between said inner end and crank hub during said slideable positioning and transmitting rotative motion directly between said inner end and crank hub; a male torque blade operably connected at an outer end to said second actuator partially rotatable thereby, said male torque blade having an inner end axially slideably positioned partially telescoped by said female torque blade inner end, said male torque blade including engagement means at least at said inner end automatically operable between said female and male torque blade inner ends upon said slideable positioning positively requiring preset single position relative circumferential positioning between said inner ends during said slideable positioning and transmitting rotative motion directly between said inner ends and by said female torque blade inner end directly to said crank hub.

4,100,775

COMBINATION LOCK

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.

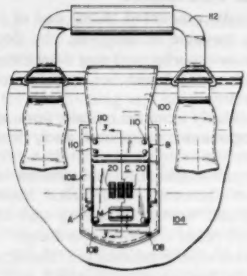
Filed Jan. 12, 1977, Ser. No. 763,687

Int. Cl.[2] E05B *65/48*

U.S. Cl. 70—3 **11 Claims**

1. A combination lock cooperable with a hasp, the combination lock comprising a shaft, dials having indicia thereon, sleeve means for each dial on the shaft, each sleeve means having a flange and a flat portion, a slotted bolt member having the dials extending therethrough adjacent the sleeve means, means pivotally mounting the bolt member, resilient means urging the bolt member against the sleeve means, a latch member mounted to overlie the bolt member for sliding movement in a plane perpendicular to the longitudinal axis of the shaft between a latching position where the latch member is engageable with the hasp and a release positon, means provided by the bolt member and cooperable means provided by the latch member to block movement of the latch member toward re-

lease position when a flange engages and pivots the bolt member against the force of the resilient means, and means provided



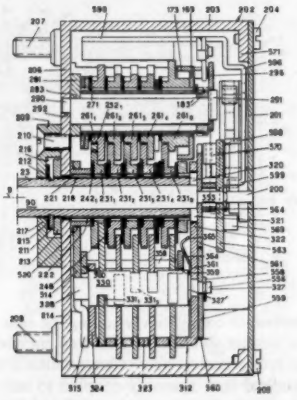
by the latch member to allow by-passing the bolt member and movement of the latch member to release position when all flat portions are in engagement with the bolt member.

4,100,776

COMBINATION LOCK FOR SAFES AND THE LIKE

François Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed Dec. 17, 1976, Ser. No. 751,639
Claims priority, application France, Dec. 31, 1975, 75 40357
Int. Cl.[2] E05B *37/12*
U.S. Cl. 70—303 A **19 Claims**



1. A combination lock for controlling the motion of a lock latch, comprising:

(a) A plurality of components having notches formed therein, each displacable as a function of a numeral in the combination so that, upon display of the right combination, the notches are aligned to permit actuation of means for retraction of said latch;

(b) first means actuatable selectively to displace any one of said components to a position corresponding to a particular numeral in said combination and to provide an indiation of said position;

(c) second means actuatable to determine which of said components is to be displacable by actuation of said first means;

(d) a rake actuated by said first means for engaging said notches when there are aligned to permit actuation of means for retracting said latch, said rake being held at a distance from said notched components during the displacement thereof; and

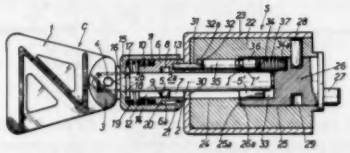
(e) a frictional coupling means between said first means and said rake for limiting the force exerted on said rake by said first means.

4,100,777

LOCKING DEVICES

Pierre André Gaston Fredon, Hameau des Tilleuls (Le coulon), 4, rue des Charmes, 94320 Thiais, France

Filed Jul. 12, 1976, Ser. No. 704,667
Claims priority, application France, Jul. 18, 1975, 75 22512
Int. Cl.[2] E05B *27/00, 19/12*
U.S. Cl. 70—363 **14 Claims**



1. A combination of a key and a lock, said key comprising:

a shaft;

a manual grip at one end of said shaft;

a key bit at the other end of said shaft;

a radial projection extending from said shaft between said grip and said bit;

a bush mounted on said shaft and defining a translation groove for said projection and a rotation groove for said projection, said grooves intersecting one another and receiving said projection;

a plurality of pegs on said bush and extending parallel to said shaft towards said key bit; and

means for resiliently urging said bush to a locking position in which said projection engages only said translation groove which extends parallel to said shaft, said rotation groove extending circumferentially of said bush; and

said lock comprising:

a stator member defining a key entry passage shaped to receive said key bit and said shaft and also defining a corresponding plurality of parallel passages shaped and arranged to receive said plurality of pegs;

a rotor member mounted to said stator member and shaped and arranged to receive said key bit and the respective end of said shaft and to be rotatable thereby relative to the stator member;

a corresponding plurality of resiliently outwardly biased pins mounted in said rotor member to engage in said plurality of parallel passages and thereby lock said rotor member to said stator member;

a further plurality of pins in said parallel passages to abut said first said plurality of pins, said pegs being of such lengths that when said key is engaged with said lock so as to locate said radial projection in said rotation groove and thereby render said shaft free to rotate relative to said bush, said pegs urge said pluralities of pins in positions such that said rotor member is free to rotate relative to said stator member; and

lock actuating means mounted to said rotor member.

4,100,778

KEY WITH TRANSVERSE SLOTS AND METHOD OF MAKING SAME

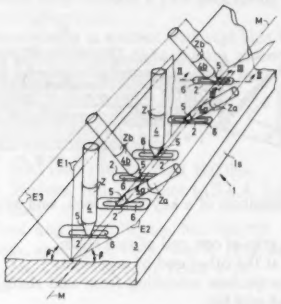
Heinrich Gretler, Hinwil, Switzerland, assignor to Bauer Kaba AG Sicherheits-Schliessyteme, Wetzilon, Switzerland

Filed Oct. 13, 1976, Ser. No. 732,094
Claims priority, application Switzerland, May 20, 1976, 6380/76
Int. Cl.[2] E05B *27/04*
U.S. Cl. 70—406 **5 Claims**

1. A key having an elongated substantially rectangular shank portion for use in combination with a cylinder lock of the type having a generally rectangular key slot for receiving the shank portion and a plurality of sets of tumbler pins, at least one of said sets being inclined relative to a side of said slot, the key comprising

means in at least one surface of said shank portion defining a plurality of elongated recesses for receiving the distal ends of tumbler pins in said sets,

the longer dimensions of each of said recesses extending transversely perpendicular to the longitudinal insertion direction of said shank portion,



said recesses having base surfaces spaced from said one surface, the spacing of selected ones of said base surfaces from said one surface being significantly different from the spacing of the remaining ones of said base surfaces from said one surface.

4,100,779

KEY CHAIN RETAINER

Joseph D. Schachter, 866 Elm St., Manitoba, Canada

Filed Apr. 4, 1977, Ser. No. 784,151

Claims priority, application Canada, Feb. 28, 1977, 272840

Int. Cl.[2] A44B *15/00*

U.S. Cl. 70—456 R **7 Claims**

1. A key retainer comprising a block of resilient compressible foam material, and means for holding said key comprised of a chain passing through a hole completely through the block of material, fixed at one end to a button having a diameter substantially wider than the hole, the button being located directly against the surface of the block of material, the hole having diameter smaller than the width of the chain whereby the sides of the hole retain the chain in position by friction.

4,100,780

PROGRAM CONTROLLED TUBE BENDING MACHINE AND A BINARY FEED MECHANISM FOR USE THEREIN

Frank Sassak, c/o Bend-Rite Inc., 2215 Howard Ave., Detroit, Mich. 48216

Filed Jan. 2, 1976, Ser. No. 646,152

Int. Cl.[2] B21B *37/14*; F15B *21/02*

U.S. Cl. 72—7 **14 Claims**

1. A binary controlled tube bending apparatus for programably forming a plurality of bends at predetermined spaced locations along the length of a tubular workpiece, each of said bends having a predetermined radial orientation with respect to any other bend and each having a predetermined depth of bend, said apparatus comprising:

an elongated work support;

a bending station mounted at one end of said support and having a movable bending die, the depth of the bend formed in said workpiece being determined by the amount of displacement of said bending die with respect to a normal position;

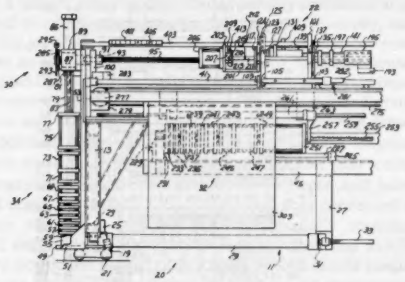
a carriage slidably mounted on said work support for reciprocal movement toward and away from said bending station;

a rotatable arbor assembly mounted on said carriage for movement therewith, said arbor assembly releasably clamping said workpiece during said longitudinal positioning and radial orienting operations;

a first program storing information relating to the number of longitudinal feed increments which said workpiece must be advanced to properly position the next sucessive predetermined bend location at the bending station;

a first circuit means for reading said stored information and generating a plurality of control signals representative thereof;

a first binary feed mechanism having a feed member and a plurality of cylinder-piston assemblies, each of said assemblies having a different length piston stroke representing a different binary number, said assemblies being serially coupled to said feed member and responsive to said plurality of control signals for actuating different ones of said



assemblies for cumulatively adding the sum of said binary piston strokes to advance said feed member a predetermined programed number of longitudinal feed increments;

a longitudinal feed assembly coupled to said carriage and responsive to the advancement of said feed member for longitudinally positioning said workpiece so as to position the next successive predetermined bend location before said bending station;

a second program storing information relating to the radial orientation of the next successive bend with respect to the previous bend;

a second circuit for reading said stored information and generating a plurality of rotational control signals representative thereof;

a second binary feed mechanism having a feed member and a plurality of cylinder-piston assemblies, each of said assemblies having a different length piston stroke representing a different binary number, said assemblies being serially coupled to said feed member and responsive to said plurality of rotational control signals for actuating different ones of said assemblies for cumulatively adding the sum of said binary piston strokes to advance or retract said feed member a predetermined programed number of rotational feed increments;

an arbor assembly rotating means responsive to the advancing or retracting of said feed member to rotate said workpiece to said predetermined programmed radial orientation;

a third program storing information relating to the predetermined depth of a given bend to be formed in the workpiece;

a third circuit for reading said stored information and generating a plurality of depth limit control signals;

a positionable limit switch responsive to said movable die having attained a predetermined position with respect thereto for deactivating said bending die and re storing it to said normal position; and

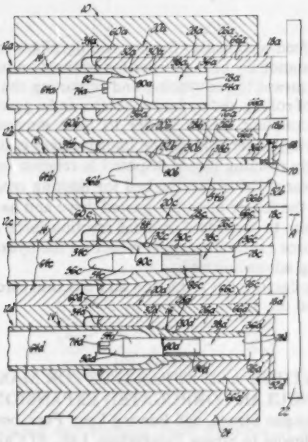
a third binary feed mechanism mounting said limit switch and having a plurality of cylinder-piston assemblies, each of said assemblies having a different length piston stroke representing a different binary number, said assemblies being serially coupled and responsive to said plurality of depth limit control signals for cumulatively adding the sum of said binary piston strokes to position said limit switch to a predetermined location so as to terminate bending when said predetermined programmed depth of bend is attained.

4,100,781

AXLE SPINDLE FORMING METHOD

Joseph H. Zawacki, Detroit, and John P. Dutton, Dearborn Heights, both of Mich., assignors to Lear Siegler, Inc., Detroit, Mich.

Filed Mar. 2, 1977, Ser. No. 773,456
Int. Cl.² B21B *45/02*; B21D *22/00*
U.S. Cl. 72—41 **7 Claims**



1. A method for hot forging a round axle spindle comprising: gripping a hollow axle blank having a heated end on which a round spindle is to be forged; positioning a hollow punch having an annular inner work surface and an elongated central mandrel fixed in a space relationship within the work surface adjacent the axle blank end; and moving the punch relative to the axle blank such that the mandrel is received within the axle blank heated end as the punch work surface forges the axle blank about the mandrel for a greater distance than the spacing between the work surface and the mandrel so as to thereby forge a round axle spindle.

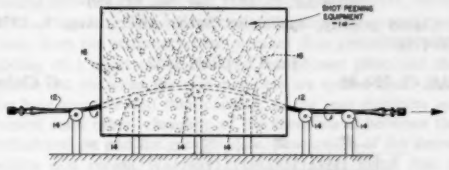
4,100,782

SHOT PEENING PROCESS

Robert A. Clay, 17392 Laurie La., Tustin, Calif. 92680

Filed Nov. 1, 1976, Ser. No. 737,540
Int. Cl.² B24C *1/00*
U.S. Cl. 72—53 **1 Claim**

1. A shot peening process for the treatment of elongated members such as rods, pipes, and the like, said process comprising: passing the elongated member through shot peening equipment along an arcuate path to subject the surface of the elongated member to cold working by streams of shot directed at its surface within the equipment, and rotating the elongated



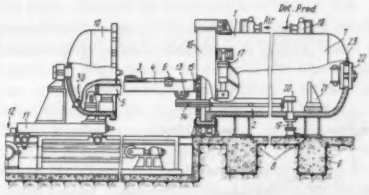
member about its longitudinal axis as it is passed through the shot peening equipment to provide a continuous flexing action thereto.

4,100,783

INSTALLATION FOR EXPLOSION MACHINING OF ARTICLES

Vitaly Stepanovich Gambarov, ulitsa Promyshlennaya, 8, kv. 73; Alexandr Fedorovich Demchuk, ulitsa Tereshkovoi, 12, kv. 6; Vladlen Alexeevich Okladnikov, ulitsa Oleko Dundicha, 29, kv. 13; Boris Leonidovich Troinin, ulitsa Grekova, 13; Andrei Andreevich Deribas, ulitsa Pravdy, 1, kv. 20; Alexandr Grigorievich Tsarenko, ulitsa Axenova, 11, kv. 401; Valentin Ivanovich Fetisov, ulitsa Tenistaya, 3, kv. 16; Veniamin Yakovlevich Khenkin, ulitsa Fizkulturnaya, 23, kv. 15; Georgy Petrovich Neupokoev, ulitsa Pervomaiskaya 162, kv. 16, all of Novosibirsk; Vladislav Vitalievich Drapaljuk, kvartal 12, 7, kv. 11, Donetsk Rostovskoi oblasti, and Mstislav Vladimirovich Gentse, ulitsa Pervomaiskaya, 190, kv. 13, Novosibirsk, all of U.S.S.R.

Filed Feb. 14, 1977, Ser. No. 768,619
Int. Cl.² B21D *26/02*
U.S. Cl. 72—56 **4 Claims**



1. An installation for explosion working of articles comprising explosion chamber means having a chamber split into a movable part and a stationary part; a work table installed in the stationary part of said chamber; a movable platform having one of its ends articulated to said movable part of said chamber for joint movement therewith so that in one extreme position said platform is set on said work table and said chamber is closed and in the other extreme position said platform is free from said work table and said chamber is fully open; clamps attached to the platform for gripping articles to be explosively treated; a charge initiating system positioned in the chamber for initiating a charge for explosively treating the article; and a system for ventilating the chamber.

4,100,784

FINNED TUBING

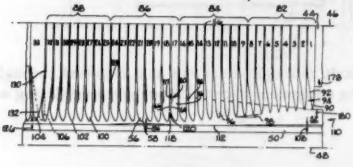
Hector Thomas, Johannesburg, South Africa, assignor to Heat Exchangers Africa Limited, Johannesburg, South Africa

Filed Jul. 27, 1977, Ser. No. 819,658

Claims priority, application South Africa, Aug. 9, 1976, 76/4761

Int. Cl.² B21H *3/12*

U.S. Cl. 72—98 **47 Claims**



1. A method of manufacturing finned tubing from tubular metal fin stock on a tube liner by means of a plurality of rollers rotatably drivable by means of arbors and each roller including a plurality of axially arranged forming discs, the method including deforming the metal of the fin stock to form a fin by forcing the metal into a restricted radially directed axial space defined between adjacent forming discs so that metal is uninterruptedly in contact with a portion of the axially directed face of one disc defining the restricted space but is only in partial contact with the opposing axially directed face of the adjacent disc defining the restricted space, there being no contact over a radially extending portion spaced radially inwardly from the disc periphery.

4,100,785

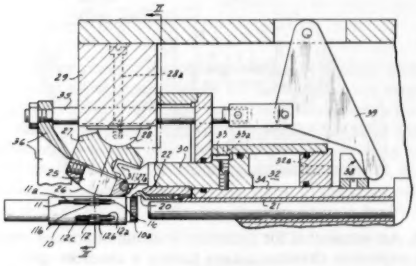
METHOD AND APPARATUS FOR MANUFACTURING VALVE COMPONENTS

Arthur E. Bishop, 5516 Westwood La., Birmingham, Mich. 48010

Continuation of Ser. No. 436,511, Jan. 25, 1974, abandoned, which is a division of Ser. No. 124,903, Mar. 16, 1971, Pat. No. 3,800,306, which is a division of Ser. No. 802,359, Feb. 26, 1969, Pat. No. 3,591,136. This application Apr. 22, 1977, Ser. No. 790,091

Int. Cl.² B21K *1/24*

U.S. Cl. 72—189 **3 Claims**



1. Apparatus for embossing a plurality of peripherally spaced axially extending irregularly shaped valve port depressions into a cylindrical valve core comprising: first means supporting said core, and positively gripping it for movement along its axis, a plurality of identical embossing tool members mounted pivotally for movement of their forming surfaces generally axially and radially toward said core and into interference fit therewith, means moving said first means axially and contacting said tool members at one end thereof and simultaneously forcing said tool members to pivot into said core progressively while moving said core progressively directly under said pivots in exactly timed relation to said tool members; said tool members having their radially inwardly facing surface shaped with the precision configuration in plan and depth of the final form of said valve port of said core whereby the precise final port form in depth and width is embossed in said core.

4,100,786

FEED MECHANISM FOR PILGER ROLLING MILLS

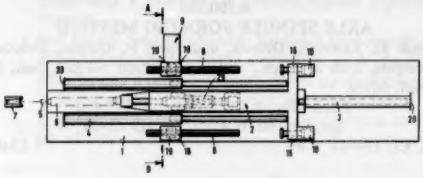
Walter Vom Dorp; Hans Georg Ritter. both of Monchen-Gladbach, and Fritz Witteck, Viersen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,553

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617662

Int. Cl.² B21B *17/06*

U.S. Cl. 72—252 **14 Claims**



1. In a feed mechanism for hot rolling pilger mills and including a stationary bed, a feeder for connection to a mandrel, hydraulic means for advancing and retracting the feeder in a direction of rolling and opposite thereto, and a geared drive for selective coupling to the feeder to limit movement of the feeder during pilger rolling, the improvement comprising:

resiliently reacting means disposed in relation to the feeder, the geared drive and the bed for limiting reaction forces from the feeder upon the geared drive and having a resilient bias to provide a resilient reaction force in excess of the force exerted upon the feeder by the hydraulic means during advancing and

during pilgering the retraction and reaction forces together exceed the advance forces by 50%.

4,100,787

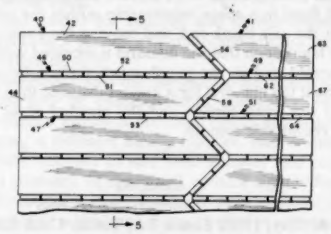
METHOD AND APPARATUS FOR MAKING RECTANGULAR CORRUGATED EXPANSION JOINTS

George Thomas Straza, and Edward Leon Parr, both of El Cajon, assignors to Straza Enterprizes, Ltd., El Cajon, Calif.

Division of Ser. No. 656,130, Feb. 9, 1976, Pat. No. 4,052,948. This application Jul. 29, 1977, Ser. No. 820,083

Int. Cl.² B21D *13/10*

U.S. Cl. 72—310 **4 Claims**



1. Apparatus for use in making a corrugated corner piece comprising:

a pair of hinge plate members,

each of said hinge plate members comprising a plurality of

elongated flat plates that are joined together along their adjacent parallel side edges by a tubular hinge member comprising a plurality of tubular hinge elements with a pin fitting through the hinge elements,

each plate member having at a given location along the length thereof a line of a plurality of hinge elements extending at an angle to the side edges of the plate members,

the angle of each line of hinge elements being at a cross angle to the hinge element line of the adjacent plate member, forming a zig-zag orientation of the cross hinge elements in a direction normal to the longitudinal edge of each of the plate members,

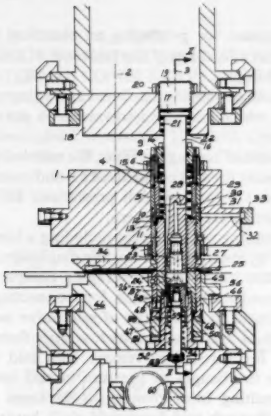
and clevis means comprising a pair of adjacent fingers jointed at one end and having internal longitudinal grooves for fitting over adjacent and aligned longitudinal hinge members holding the hinge members and a blank positioned therebetween in a sandwiched alignment.

4,100,788

BLANKING AND FORMING PRESS FOR SHEET METAL CAPS

Rino Morini, Via San Francesco 35, Imola (Province of Bologna), Italy

Filed Apr. 4, 1977, Ser. No. 784,864
Claims priority, application Italy, Apr. 13, 1976, 3399 A/76
Int. Cl.² B21D *24/16*
U.S. Cl. 72—329 **2 Claims**



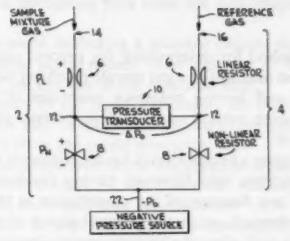
1. A blanking and forming press for caps of sheet metal comprising a stationary base member, at least one cylindrical seat provided in said base member, a sleeve slidable guided in said seat and having one end portion defining an outer blanking edge and the opposite end portion provided with an outer collar arranged between a shoulder and an abutting step which are formed inside said seat, elastic means arranged in said seat and axially urging said sleeve in a resting position in which said collar abuts against said step and said one end portion extends out of said seat, said elastic means permitting said collar to abut against said shoulder when the sleeve is forced in the opposite direction, a first ram member movably supported with respect to said stationary base member on one side thereof, a rod extending through said sleeve and coaxially thereto and having one end connected to said first ram member, a forming punch connected to the opposite end of said rod, a cutting ring arranged between said forming punch and said rod, said ring being guided in said sleeve, a second ram member movably supported with respect to said stationary base member and on the side thereof opposite to that on which the first ram is located, a cylindrical die coaxial to said rod and supported by said second ram member, said cylindrical die having an inner blanking edge cooperating with the outer blanking edge of said sleeve, a cylindrical drawing element positioned inside said die and defining an axial bore for receiving the punch and the cutting ring, said element forming a recess with said die for receiving the one end portion of said sleeve, a presser plate elastically supported by said stationary base member and arranged between the latter and the second ram member, means for moving said first and second ram members toward and away from the stationary base member thus permitting positioning of a sheet metal between the presser plate and the cylindrical die when the ram members are spaced apart from the base member and then causing, as the ram members approach each other, clamping of the sheet metal between the cylindrical die and the presser plate, penetration of the sleeve within said recess, whereby a circular sheet metal disc is blanked and then clamped between said sleeve and cylindrical element, advancing the punch against said disc thus causing the clamped portion of the disc to slip within said bore and trimming of the peripheral portion of the disc by said cutting ring.

4,100,789

FLUIDIC PARTIAL PRESSURE SENSOR

James W. Joyce, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1977, Ser. No. 819,745
Int. Cl.² G01N *31/00*
U.S. Cl. 73—23 **8 Claims**



1. A fluidic partial pressure sensor for obtaining direct indication of the partial pressure of gas constituent in a mixture which comprises:

a first input channel for receiving a reference gas;

a second input channel for receiving a sample mixture gas;

a fluidic bridge which comprises a pair of linear resistors connected respectively to each of the input channels, a pair of non-linear resistors connected at a first junction in series to each of the linear resistors and at a second junction to a reference output channel, and means for sensing pressure across the bridge; and

a means for creating a constant pressure drop across the fluidic bridge, wherein the characteristics of the linear and non-linear resistors' geometry is determined by the equation

$$\theta = \frac{bpP_b}{(a\mu)^2}$$

where

P_b = the pressure drop across the bridge

a and b = geometric constants for the linear and non-linear resistors in the bridge circuit

ρ = the density of the reference gas

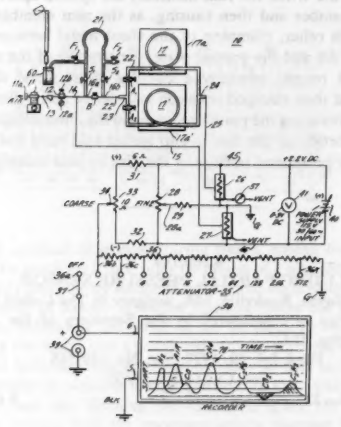
μ = the viscosity of the reference gas and

θ has a value of approximately 0.05 or less at the anticipated ambient pressures at which the sensor will operate.

4,100,790
ELECTRONIC ORSAT FOR GAS ANALYSIS

Gerald J. Harvey, Westbury, N.Y., assignor to William Printz Company, Inc., Westbury, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,617
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 1 Claim



1. A method for determining the percent concentration of oxygen and nitrogen in a gas sample provided within a storage container and having unknown quantities of nitrogen and oxygen, which method employs air as a carrier gas, comprising the steps of:

(a) adjusting a bridge circuit having filaments in two arms of said bridge, said filaments having conductivities which vary as a function of the constituents in the gas passing therethrough, so that the output signal of the bridge circuit is null when the bridge circuit is balanced:

(b) limiting the maximum magnitude of the output signal developed by the bridge circuit as a result of the most extreme unbalanced condition measureable by the bridge circuit, and identifying said magnitude as having an arbitrary value of 100 units;

(c) passing the gas sample from the storage container through a separating column containing an adsorptive material using air as a carrier which is injected into the storage container at a predetermined pressure;

(d) passing the mixture of the sample gas and air emitted from the output of the columm over a first filament of said bridge circuit;

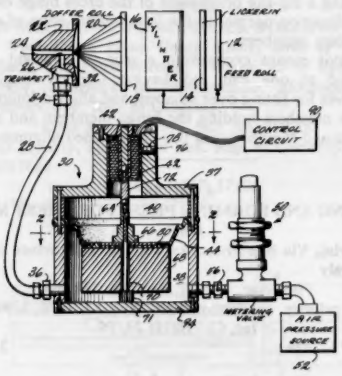
(e) simultaneously passing the air directly from its source over the remaining filament of the bridge circuit so as to generate a substantially continuous signal which is representative of the ratio of conductivities of said first and second filaments whose peak value at a predetermined time interval represents a concentration of $N_2 + O_2$ and whose polarity represents the deficiency of nitrogen or oxygen relating to the concentration of nitrogen and oxygen in air, a positive polarity peak relative to a reference level representing a percentage of oxygen in the gas sample of less than 21/100 and a negative polarity peak relative to the reference level representing a percentage of oxygen in said gas sample of greater than 21/100;

(f) determining the exact percentage ratio of nitrogen in the nitrogen plus oxygen constituents of the gas sample by increasing 21% of the peak value of the signal occurring at the aforesaid predetermined time interval by 79 units.

4,100,791
AUTO-LEVELER

George J. Miller; Kenneth G. Lytton, and James E. Donnelly, all of Gastonia, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Filed May 2, 1977, Ser. No. 792,765
Int. Cl.[2] G01B *13/08*
U.S. Cl. 73—37.7 5 Claims



1. An apparatus for producing an electrical output signal which varies as a function of the thickness of a sliver of textile fibers comprising:

a first member having a bore extending therethrough through which said sliver travels and a port opening into said bore;

a valve member having an input for receiving pressurized air, an outlet for said pressurized air and means defining an escape port through which pressurized air escapes from said outlet to the atmosphere;

a hollow housing sensor means including a housing member defining an inner space, a flexible diaphragm dividing said inner space into a lower averaging compartment and an upper compartment, means for connecting said lower compartment to said outlet of said valve member and to said port of said first member, a shaft fixed to said diaphragm for vertical movement with said diaphragm in response to changes of pressure in said lower compartment resulting from changes in thickness of said sliver passing through said bore, said shaft having a magnetic portion in said upper compartment, a weight member fixed to said shaft and located in said lower compartment for urging said diaphragm and shaft downward, and at least one coil wound about said shaft in said upper compartment so that vertical movements of said shaft produce said output signal in said coil as said magnetic portion moves with respect to said coil.

4,100,792
APPARATUS FOR THE TESTING OF A BRAKE SYSTEM

Heinz Leiber, Leimen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 1, 1977, Ser. No. 773,254
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611369
Int. Cl.[2] G01L *5/28*
U.S. Cl. 73—39 5 Claims

1. Apparatus for the testing of a brake system comprising:

a brake cylinder having an outlet line and a return line;

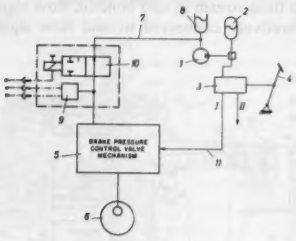
a dual actuated brake pressure control valve mechanism connected to said outlet of said brake cylinder;

a pressure sensor connected to said return line downstream of said control valve mechanism;

a discriminator connected to said pressure sensor for com-

paring actual pressures gauged by said sensor with an optimal pressure; the improvement wherein:

a selectively switchable double-acting electromagnetic valve is connected in said return line downstream of said

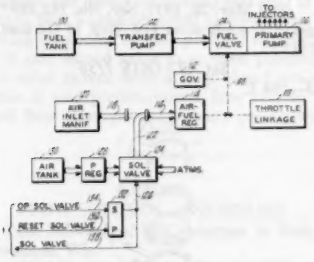


sensor, said double-acting valve serving to open and close said return line; whereby pressure conditions in said brake cylinder can be gauged and said double-acting valve opened to permit a pressure decrease in said dual actuated brake pressure control valve mechanism.

4,100,793
AIR/FUEL REGULATOR DIAGNOSTICS FOR INTERNAL COMBUSTION ENGINE

Henry E. Goetsch, Windsor, Conn.; James A. Cook, Agawam, Mass., and Lee R. Armstrong, Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,092
Int. Cl.² G01M *15/00*
U.S. Cl. 73—118 **6 Claims**



6. In the method of testing an engine air/fuel ratio regulator while mounted on an internal combustion engine, the steps of:

causing the engine to accelerate under the throttle from a low speed to a high speed with the air/fuel ratio regulator thereof forced to provide full fuel to the engine, while the engine is loaded only with its own inertia, drag and accessories, and measuring an indication of full fuel horsepower demonstrated by the engine during the acceleration thereof;

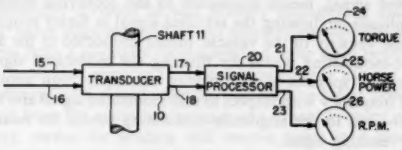
causing the engine to accelerate under full throttle from a low speed to a high speed with the air/fuel ratio regulator thereof forced to provide limited fuel to the engine, while the engine is loaded only with its own inertia, drag and accessories, and measuring an indication of fuel-limited horsepower demonstrated by the engine during the acceleration thereof; and

subtracting the indication of fuel-limited horsepower from the indication of full fuel horsepower and providing a manifestation of the difference as a measure of effective operation of the air/fuel ratio regulator of the engine.

4,100,794
SYSTEM FOR MEASURING TORQUE AND SPEED OF ROTATING SHAFT

Edwin Joseph Meixner, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 6, 1976, Ser. No. 747,577
Int. Cl.² G01L *3/24*
U.S. Cl. 73—136 A **14 Claims**



1. An indicating system for providing information regarding the torque and the speed of a rotatable shaft, comprising:

a transducer, including a first magnetic core assembly having a plurality of electrical windings thereon, and means for coupling all the windings in a first electrical circuit, and second and third magnetic core assemblies, each substantially identical to the first magnetic core assembly, with each having a plurality of electrical windings thereon, and means for coupling such windings of the second and third magnetic core assemblies in a series circuit;

means for supplying an a-c signal to the electrical circuit, to provide an energizing flux from the first magnetic core assembly;

a signal processor, including a detector circuit, for producing an output signal related to at least one of the torque and speed parameters of the rotatable shaft;

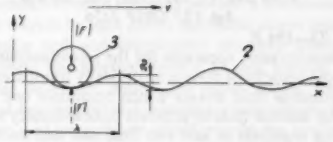
means, coupled to the signal processor, for providing the shaft torque and/or speed information as the output signal is received from the signal processor; and

switch means, coupled between the signal processor and the series circuit formed by the electrical windings on the second and third magnetic core assemblies, for determining whether the signal processor output signal connotes torque or speed information.

4,100,795
PROCESS AND A SYSTEM FOR MEASURING AND RECORDING UNDULATORY DEFORMATIONS OF A RAIL SURFACE

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland and Frank Speno Railroad Ballast Cleaning Co., Inc., Ithaca, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,440
Claims priority, application Switzerland, Mar. 14, 1975, 3232/75
Int. Cl.² B61K *9/00*
U.S. Cl. 73—146 **17 Claims**



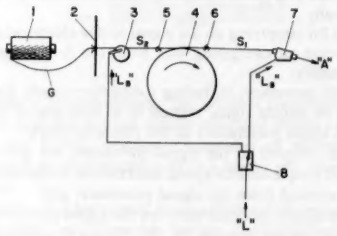
10. A system for measuring and recording undulatory deformations along a rail surface, comprising means mountable on a rail-born vehicle for feeling said deformations along the surface, an accelerometer connected to said feeling means to generate a voltage signal representative to the vertical acceleration induced in the feeling means by said undulatory deformations, means connected to said accelerometer for amplifying

the voltage signal, means including a filter connected to the amplifying means for filtering the amplified signal as a function of the velocity of the vehicle, said filter having a central frequency and band width which vary such that the response characteristics of the filter to wavelengths of the undulations of the rail falling within a range desired to be measured are substantially independent of the velocity, means connected to the filtering means for twice integrating the filtered signal, means connected to the integrating means for rectifying the integrated signal, means connected to the rectifying means for amplitude-modulating the rectified signal in direct proportion to the velocity of the vehicle, means connected to the amplitude-modulating means for filtering the modulated signal to eliminate spurious signals having extremely high amplitude and frequency with respect to said modulated signal and means connected to the amplitude-modulating means for recording the resulting signal.

4,100,796
TEST APPARATUS

Joachim Gayler; Rolf Remy; Werner Moeller, and Fritz G. Holler, all of Wuppertal, Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 27, 1977, Ser. No. 846,048
Int. Cl.[2] G01N *3/34, 3/36*
U.S. Cl. 73—160 **3 Claims**



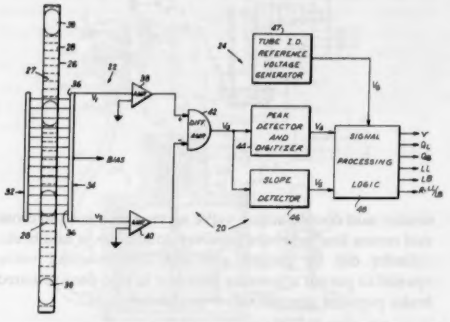
1. An improvement in yarn test devices including a yarn package supply, an adjustable drive godet, and a yarn suction device in series; the improvement comprising an intermittantly operable yarn tensioning device located between the yarn package supply and drive godet and means for alternately actuating the yarn suction device and the yarn tensioning device to accelerate and decelerate a yarn being tested between a full running condition and a full stop condition.

4,100,797
NON-INVASIVE METHOD AND APPARATUS FOR INSTANTANEOUS FLOW MEASUREMENT OF A SEGMENTED FLUID STREAM

Bruce J. Oberhardt, Hartsdale, and Donald F. Kopelman, Hastings-on-Hudson, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,928
Int. Cl.[2] G01F *1/56*
U.S. Cl. 73—194 E **17 Claims**

1. In non-invasive apparatus for the instantaneous measurement of the velocity of flow in an optically transparent conduit of a continuous fluid stream which comprises one fluid segmented by another fluid of different optical density to result in alternating segments of said one fluid and said another fluid, respectively, the improvements comprising, flow signal generation means including a light source disposed to one side of said conduit, position sensitive optical detecting means having an active surface disposed to the other side of said conduit in such manner that the light from said light source which passes through said fluid stream will impinge upon said active surface, said position sensitive optical detecting means being operable to detect the position of the centroid of the light which impinges on said active surface and to provide output signals proportional thereto and which change in accordance with change in said centroid position, means to operate upon said signals to provide a flow signal having a characteristic which is representative of the instantaneous velocity of flow of said segmented fluid stream in said conduit, flow signal processing means operatively connected to said flow signal generation

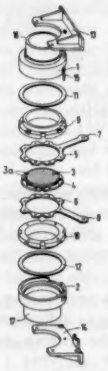


means, means to apply a reference signal representative of the inner diameter of said conduit to said flow signal processing means, and detecting means in said signal processing means operable to detect said characteristic and combine the same with said reference signal to provide a signal indicative of the instantaneous flow rate of said fluid stream through said conduit.

4,100,798
FLOW METER WITH PIEZO-CERAMIC RESISTANCE ELEMENT

Kenth Nilsson, Akersberga, and Olov Ekström, Brottby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1977, Ser. No. 782,189
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622117
Int. Cl.[2] G01F *1/36*
U.S. Cl. 73—194 E **7 Claims**



1. A flow meter for medical pulmonary function diagnoses comprising:

a flow tube having an interior cross-section;

a flow resistance element comprising a piezo-ceramic material having through-flow passages for a respiratory gas; and

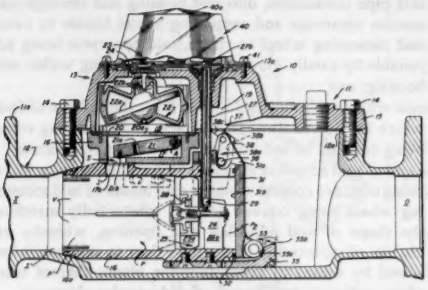
an electrical contact means associated operatively with said flow resistance element for measuring electrical characteristics of the piezo-ceramic material as a gas is passed through the meter.

4,100,799

COMPOUND METER ASSEMBLY

Allen C. Bradham, III, and Edward A. Seruga, both of Milwaukee, Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed Dec. 1, 1976, Ser. No. 746,536
Int. Cl.[2] G01F 7/00
U.S. Cl. 73—197 31 Claims



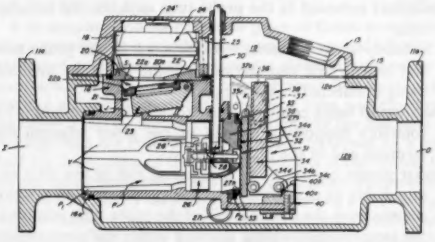
1. A meter assembly for accurately measuring variable liquid flow therethrough, said assembly comprising a housing having an inlet and an outlet, and primary and secondary passageways in communication with said inlet and said outlet; a first meter disposed within said primary passageway and being adapted to measure high rates of liquid flow through said assembly; a second meter disposed within said secondary passageway and being adapted to measure low rates of liquid flow through said assembly; a first valve disposed within said secondary passageway and movable to a substantially closed position when the liquid flow therethrough is increasing and has exceeded a first predetermined flow rate thereby causing a sudden pressure impulse to be produced and the liquid flow to be substantially diverted to said primary passageway; a second valve disposed within said primary passageway and being responsive to said pressure impulse; and means for holding said second valve in a closed position with a predetermined locking force, said locking force being overcome by said pressure impulse to permit movement of said second valve to an open position whereby said second valve moves from a fully closed position to an open position at said predetermined flow rate to thereafter permit liquid flow through said primary passageway to said outlet.

4,100,800

FLOW CONTROL ASSEMBLIES

Thomas E. Pelt, Milwaukee, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Dec. 1, 1976, Ser. No. 746,537
Int. Cl.[2] G01F 7/00
U.S. Cl. 73—197 29 Claims



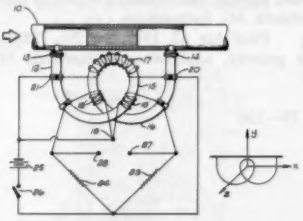
1. A meter assembly for accurately measuring variable liquid flow therethrough, said assembly comprising a housing having an inlet and outlet, and primary and secondary passageways in communication with said inlet and outlet; a first meter disposed within said primary passageway and being adapted to accurately measure high rates of liquid flow through said assembly; a second meter disposed within said secondary passageway and being adapted to accurately measure low rates of liquid flow through said assembly; a first valve disposed within said secondary passageway and movable to substantially a closed position when the liquid flow therethrough is increasing and has exceeded a first predetermined flow rate whereby a sudden pressure impulse is momentarily produced and the liquid flow is substantially diverted to said primary passageway; and a second valve disposed within said primary passageway and movable from a normally closed position to an open position when the sudden pressure impulse is momentarily exerted on the upstream side of said second valve and the liquid flow is diverted from the secondary passageway to said primary passageway, means for holding said second valve in a closed position with a predetermined locking force, said locking force being overcome by said pressure impulse to permit movement of said second valve to an open position; said second valve including first and second sections mounted for movement independently of one another, said first section being movable against a seat in said closed position to preclude flow through said primary passageway, and said second section engaging said first section to move said first section into said closed position and effect such holding of said first section in said closed position.

4,100,801

MASS FLOW SENSING SYSTEM

Dan B. LeMay, Palos Verdes Estates, Calif., assignor to Tylan Corporation, Torrance, Calif.

Continuation-in-part of Ser. No. 656,543, Feb. 9, 1976, Pat. No. 4,056,975. This application Apr. 25, 1977, Ser. No. 790,512
The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.
Int. Cl.[2] G01F 1/68
U.S. Cl. 73—202 27 Claims



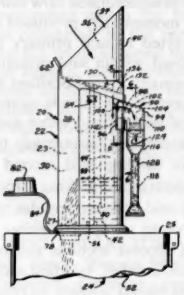
1. In apparatus for measuring the rate of mass flow of a fluid in a first conduit wherein a sensing conduit is communicatingly connected thereto by inlet means and outlet means and including a heating coil and temperature sensitive resistor coils wound around the external surface of said sensing conduit intermediate said inlet means and outlet means, means for heating said heating coil and detecting a temperature differential between said temperature sensitive coils, the improvement according to which said sensing conduit defines at least one helix loop intermediate said inlet means and outlet means and forming a continuous passageway providing reversal flow of said fluid therebetween, said loop being substantially in a plane parallel to the direction of flow of fluid in said first conduit, said heating coil being wound around a portion of said looped tube and said temperature sensitive coils being wound one on each side of said heating coil.

4,100,802

LIQUID MEASURING DEVICE

Terry N. Layton, Wheeling, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 8, 1977, Ser. No. 804,653
Int. Cl.[2] G01F *1/02*
U.S. Cl. 73—215 **14 Claims**



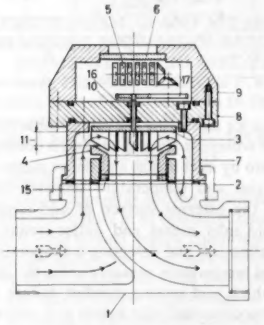
1. A device for measuring a liquid discharge, comprising: a hollow receptacle having an inlet port adjacent an upper end of the receptacle to receive the liquid discharge and channel means communicating with the inlet port to receive the liquid passing through the inlet port, means for diverting only a portion of the discharge from the channel means while permitting passage of an additional portion of the discharge through the channel means, cavity means to receive the diverted portion of the discharge from the diverting means, a collection chamber below the cavity means to receive liquid from the cavity means, and means for limiting passage of liquid from the cavity means into the collection chamber, said additional portion of the discharge passing through the channel means without passing into the cavity means.

4,100,803

APPARATUS FOR MEASURING THE VOLUME OF A FLOWING FLUID, PARTICULARLY A GAS IN PIPES

Heinz Gass, Kriens, Switzerland, assignor to Gas- und Wassermesserfabrik AG, Switzerland

Filed Apr. 18, 1977, Ser. No. 788,617
Claims priority, application Switzerland, May 18, 1976, 6204/76
Int. Cl.[2] G01F *1/08*
U.S. Cl. 73—230 **2 Claims**



1. Apparatus for measuring the volume of fluid flow in a pipe, said apparatus comprising:

a single duct pipe connection mounted in said pipe;

a housing mounted on said pipe connection;

a measuring wheel having a plurality of blades thereon rotatably mounted within said housing;

an adjusting ring within said housing coaxial with said measuring wheel, said adjusting ring, together with the interior of said housing, forming a variable width annular clearance surrounding said measuring wheel, at least part of the fluid flowing in said pipe being made to flow into said pipe connection, into said housing and through said annular clearance and measuring wheel blades to cause said measuring wheel to rotate, said apparatus being adjustable by axially moving said adjusting ring within said housing; and

means within said housing for indicating the volume of fluid which has flowed through said pipe, said measuring wheel being coupled to and operating said indicating means;

the end of said adjusting ring adjacent said measuring wheel being concave conical in shape, said blades of said measuring wheel being convex conical, substantially matching the shape of said adjusting ring opening, whereby exchange of momentum of the fluid flow to said measuring wheel by means of contacting the blades thereof takes place uniformly in all areas of said annular clearance.

4,100,804

BIMETALLIC TEMPERATURE MEASURING DEVICE

Jean Pierre Gorgerat, Echandens, Switzerland, assignor to Rueger S.A., Crissier, Switzerland

Filed Jul. 19, 1976, Ser. No. 706,892
Int. Cl.[2] G01K *5/64*
U.S. Cl. 73—363.9 **2 Claims**

1. A bimetallic temperature measuring device comprising:

a probe tube having a terminal end;

a rotary arbor mounted in the probe tube for attachment to an indicating member remote from the terminal end;

a support mounted in the probe tube adjacent the terminal end;

a helically-wound bimetal strip disposed in the probe tube and having first and second opposite ends, the first end being connected to the support;

the support being configured to provide abutment means for rotatably supporting an end of the arbor adjacent the terminal end of the probe tube;

collar means connected to the second end of the strip and attachable to the arbor at such a predetermined position remote from the terminal end of the probe tube relative to the strip for maintaining the strip under sufficient tension and for developing a predetermined force urging the arbor against the abutment means, thereby to prevent vibration of the strip at the resonant frequency thereof;

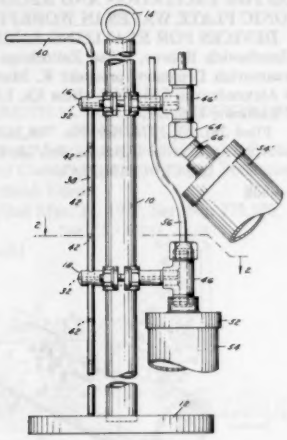
and auxiliary means for maintaining the pressure of said arbor against said abutment means.

4,100,805

SETTLING BASIN SAMPLER

George E. Cossin, Comiran Consulting Engineers, Soraya Ave., No. 1 Kouchen Mojdehi, Tehran, Iran

Filed Apr. 25, 1977, Ser. No. 790,274
Int. Cl.[2] G01N 1/14
U.S. Cl. 73—421 B 8 Claims



1. A multiple sampler for settling basins and the like comprising, in combination:
an elongated column,
means for supporting the column in a vertical position in the fluid in the settling basin,
a plurality of valves on the column at vertically spaced apart locations each having an inlet port exposed to fluid in the basin at the depth of the valve and an outlet port,
individual containers removably connected to the outlet port of each valve for individually receiving fluid admitted through the valve, and
means operable from above the surface of fluid in the basin for opening and closing the valves.

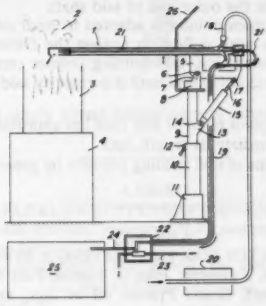
4,100,806

SAMPLING ROD FOR CORROSIVE GASES OR FUMES IN AN INCINERATOR, PARTICULARLY WHEN INSTALLED ON A SHIP

Jacques Carbonnelle, Boulogne Billancourt; Gerard Chevalier, Orsay, and Pierre Zettwoog, Le Perray en Yvelines, all of France, assignors to Commissariat a l'Energie Atomique, Paris Cedex, France

Filed Feb. 10, 1977, Ser. No. 767,620
Claims priority, application France, Apr. 2, 1976, 76 09624
Int. Cl.[2] G01N 1/24
U.S. Cl. 73—421.5 A 7 Claims

1. A sampling rod for corrosive gases or fumes in an incinerator comprising in a coaxial construction a central tube for the suction of gases made from a plastic material resistant to the corrosion by these high temperature gases, a first metallic tube forming a reinforcement for the central tube and enveloping the latter, a second metallic tube surrounding the first tube and defining with the latter an annular space traversed by a liquid fluid for the cooling of the gases circulating in the central tube and for maintaining said gases at an appropriate temperature, a layer of a thermally insulating material having a fibrous structure surrounding the second metallic tube and an outer jacket made from a refractory material which resists the mechanical and thermal shocks and ensures the distribution of the external heat in the insulating material, the space between the first and second metallic tubes traversed by the cooling fluid being separated into two annular and coaxial regions by an intermediate tube open at its end adjacent to that where the gases enter the central tube, whereby the cooling fluid is circulated in such a way that the outflow of said fluid firstly takes place in the annular region defined between the intermediate tube and the second metallic tube and then in the annular region between the intermediate tube and the first metallic tube, said two regions being connected respectively to a fluid supply tube and a fluid discharge tube at locations opposite to the end of the central tube via which the entry of the sampled gases takes place, the central tube extending axially beyond the two metallic tubes downstream of the cooling fluid supply and discharge



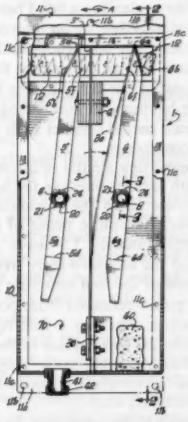
tubes to issue into the casing of a compressed air pump thus creating in the central tube a suction vacuum of the gases to be sampled, an apparatus for analyzing the content of said gases, another tube extending to said analyzing apparatus and being connected to said central tube at a location upstream of the pump, a rocking support on which is articulated the sampling rod at its end opposite to that via which the gases pass into the central tube, and an extendable jack articulated on the rod to ensure the raising or substantially horizontal positioning of the latter with the end of the central tube in the sampling area.

4,100,807

PEAK-RECORDING ACCELEROMETER

Paul D. Engdahl, 2850 Monterey Ave., Costa Mesa, Calif. 92626

Filed Jun. 10, 1977, Ser. No. 805,325
Int. Cl.[2] G01P 15/04
U.S. Cl. 73—492 8 Claims



1. A peak-recording accelerometer comprising:
a sealable case having a transparent window and a calibrated scale readable therethrough:

an acceleration-responsive mass-spring system mounted in said case and comprising a weighted resilient cantilever reed with its free end providing a main pointer deflectable along said scale; and

at least one holding-pointer having a rotary frictional connection to pivot means and having a tip portion engageable by said main pointer,

said holding-pointer having a tail portion extending beyond said pivot means and proportioned and weighted to balance it against linear acceleration,

said pivot means comprising a shaft extending with sealing means through said case; and

a reset knob on the outer end of said shaft;

whereby said main pointer is adapted to push said holding pointer to a peak deflection against the friction of said frictional connection, said holding pointer retaining and recording said deflection until it is reset by said knob, and wherein:

an equivalent pivot point of said reed lies approximately in a plane intermediate its length, and

said pivot means of said holding pointers lie generally in the same plane.

4,100,808

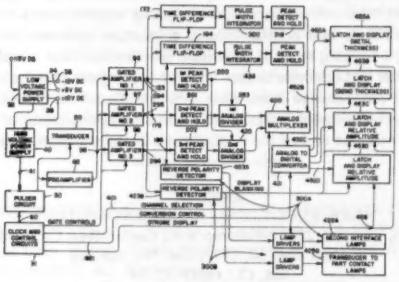
APPARATUS FOR EVALUATING A BOND

Charles B. Evans, Arlington; John D. Fenton, Fort Worth, and Bonner W. Staff, Grand Prairie, all of Tex., assignors to Vought Corporation, Dallas, Tex.

Filed Oct. 22, 1975, Ser. No. 624,620

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—588 **22 Claims**



1. Apparatus for evaluating a bond between first and second structures bonded together by an intermediate layer of adhesive to form a composite construction, the first structure having a first surface and an oppositely facing, second surface having at least partial contact with the layer of adhesive, the second structure having a surface facing the layer of adhesive and having at least partial contact with the layer of adhesive, the apparatus comprising:

means for transmitting a pulse of ultrasonic wave energy, of a wavelength shorter than the thickness of the first structure and shorter than the thickness of the intermediate adhesive layer, the pulse being of a duration at least as short as approximately 1.5 wave cycles, into the first structure and the adhesive layer from a location adjacent the outer face of the first structure and for receiving any subsequent pulses reflected from portions of the composite construction, whereby a first reflected pulse may be reflected from the first surface of the first structure and at least a second reflected pulse may be subsequently reflected from the interface between the first structure and the adhesive layer; and

means responsive to the reception, by the pulse transmitting and receiving means, of the first and second reflected pulses, and any third pulse reflected from the interface between the adhesive layer and the second structure, for producing an output signal indicative of effective bonding of the adhesive layer to both structures upon the reception by the pulse transmitting and receiving means of second and third pulses of amplitudes within respective, predetermined ranges.

4,100,809

METHOD FOR EXCITATION AND RECEPTION OF ULTRASONIC PLATE WAVES IN WORKPIECES AND DEVICES FOR REALIZING SAME

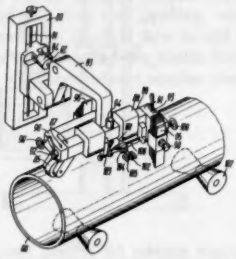
Vladimir Timofeevich Bobrov, ulitsa Zelinskogo 12, kv. 127; Jury Avraamovich Druzhaev, prospekt K. Marxa 2, kv. 19, and Nelli Alexandrovna Lebedeva, ulitsa Kh. Livshits 29, kv. 25, all of Kishinev, U.S.S.R.

Filed Jul. 23, 1976, Ser. No. 708,263

Claims priority, application U.S.S.R., Jul. 28, 1975, 2164385

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—638 **21 Claims**



1. A method of excitation and reception of ultrasonic plate waves in a workpiece comprising generating a high-frequency electromagnetic field acting on the surface of the workpiece by a transducer consisting of a system of flat radiators forming a comb-like structure positioned discretely in the direction of radiation with a pitch divisible by the wavelength; applying a magnetizing field to the workpiece whose vector is parallel to the surface of the workpiece in the area of the high-frequency electromagnetic field, and orienting the vector of the magnetizing field for exciting transverse (shear) plate waves with respect to the transducer of flat radiators at an angle α relative to the direction of radiation, wherein $|\alpha| > 0$.

4,100,810

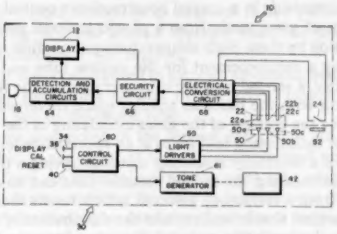
LIGHT COUPLED READ-OUT SYSTEM FOR NOISE DOSIMETER

Gordon R. Sima, Jr., Joppa Township, Harford County, and John L. Taylor, Jr., Baltimore, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 3, 1977, Ser. No. 803,172

Int. Cl.[2] G01H *3/12*

U.S. Cl. 73—647 **6 Claims**



1. In an audio dosimeter wherein a memory contains an indication which is a measure of noise dose and a display

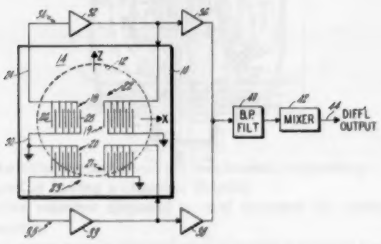
device on which said indication is shown, means for showing the memorized indication on said display device comprising a base station for generating a sequence of light encoded signals to said dosimeter and light signal decoding circuits in said dosimeter responsive to said light encoded signals for showing said indication on said display.

4,100,811

DIFFERENTIAL SURFACE ACOUSTIC WAVE TRANSDUCER

Donald E. Cullen, Manchester, and Thomas M. Reeder, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,106
Int. Cl.² G01L *1/16*
U.S. Cl. 73—654 **2 Claims**



2. A differential surface acoustic wave oscillator for measuring a parameter capable of inducing strain, comprising:

a piezoelectric diaphragm having a principal surface;

a pair of oscillators, each of said oscillators including an amplifier and a surface acoustic wave delay line connected in feedback relation with said amplifier, said delay lines formed at respective portions of said surface so that each of said oscillators has a frequence dependent on strain of the related portion of said diaphragm which is opposite in sense to that of the other of said oscillators; and

mixing means for providing as an output of said transducer the frequency difference between said oscillators, whereby the sensitivity of said transducer to strain is greater than that of either of said oscillators and the sensitivity in frequency of each of said oscillators to temperature is substantially canceled by said mixing means.

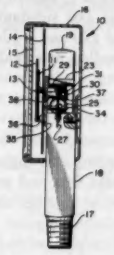
4,100,812

DRY PRESSURE GAUGE WITH DAMPENED NEEDLE MOVEMENT

Tommy L. Gray, Dallas, and Sam R. Crowe, Plano, both of Tex., assignors to Span Instruments, Plano, Tex.

Filed Jan. 5, 1977, Ser. No. 757,035
Int. Cl.² G01L *7/04*
U.S. Cl. 73—732 **12 Claims**

1. In a pressure gauge with dampened indicator movement: pressure change sensor means having an operational movement end; driven mechanism means including a gauge indicator; mass weight means added to said mechanism means; looped spring interconnect means connected at a first side to the operational movement end of said pressure change sensor means, and connected at a second side to said driven mechanism means; and wherein said looped spring interconnect



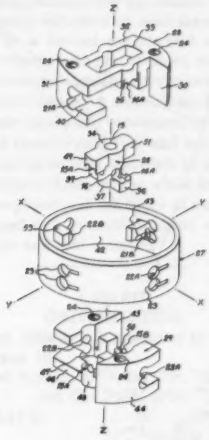
means is a single strand spring loop in substantially circular form.

4,100,813

FLEXURE SUSPENSION ASSEMBLY

Peter Luciano Previte, Paterson, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed May 13, 1976, Ser. No. 686,127
Int. Cl.² G01C *19/02*
U.S. Cl. 74—5 F **12 Claims**



1. A flexure suspension assembly comprising

a. first mounting means having a first longitudinal axis;

b. first gimbal means;

c. a first pair of single axis flexure joints coupling said first gimbal means to said first mounting means for rotation therewith about said first longitudinal axis, said first flexure joints having a second longitudinal axis substantially parallel to said first longitudinal axis and a first bending axis orthogonal thereto to permit relative angular rotation between said first gimbal means and said first mounting means about said first bending axis;

d. second gimbal means;

e. a second pair of single axis flexure joints coupling said second gimbal means to said first mounting means for rotation therewith about said first longitudinal axis, said second flexure joints having a third longitudinal axis substantially parallel to said first longitudinal axis and a second bending axis orthogonal to said longitudinal axes and said first bending axis to permit relative angular rotation between said second gimbal means and said first mounting means about said second bending axis;

f. second mounting means;

g. a third pair of single axis flexure joints coupling said second mounting means to said first gimbal means having a fourth longitudinal axis substantially perpendicular to said first longitudinal axis and a third bending axis aligned with said second bending axis; and

h. a fourth pair of single axis flexure joints coupling said second mounting means to said second gimbal means, said fourth single axis flexure joints having a fifth longitudinal axis substantially perpendicular to said first longitudinal axis and a fourth bending axis aligned with said first bending axis, whereby said first and second mounting means are coupled for rotation together about said first longitudinal axis and for relative angular rotation therebetween about both of said first and second axes.

4,100,814

SIX-BOX LINKAGE MECHANISM

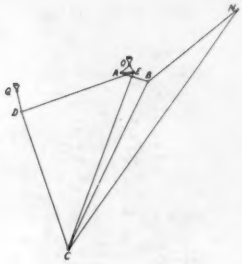
Gordon Richard Wray, Loughborough, and Ruth Mary Parry, Ringwood, both of England, assignors to National Research Development Corporation, London, England

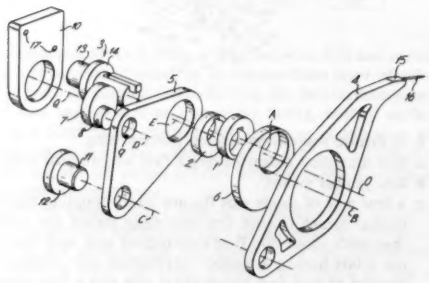
Continuation of Ser. No. 647,982, Jan. 8, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,204

Claims priority, application United Kingdom, Jan. 10, 1975, 01106/75

Int. Cl.² F16H *21/18*

U.S. Cl. 74—43 **15 Claims**





1. Means for effecting movement of an object in a closed loop planar path comprising a six-bar linkage mechanism the dimensions of the link members of which are derived from a four-bar linkage and a second linkage cognate with said four-bar linkage, said four-bar linkage being dimensioned to generate a path passing through at least selected precision points, on an idealized version of said closed loop path, said six-bar linkage mechanism including a link member which maintains a substantially fixed attitude relative to a given plane in space during execution of at least an appreciable portion of the path, said object forming at least part of or being mounted on said link member for movement therewith.

4,100,815

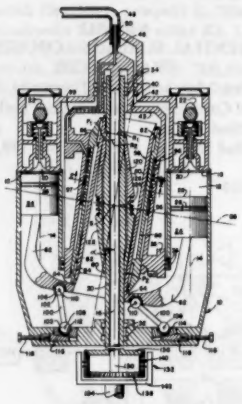
VARIABLE DISPLACEMENT PISTON ENGINE

Yves Jean Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Filed Nov. 22, 1976, Ser. No. 743,600

Int. Cl.² F16H *23/60*

U.S. Cl. 74—60 **18 Claims**



1. A piston engine comprising:

a frame;

a first shaft supported by said frame for rotation on a first axis;

a nutatable member having first and second surfaces of revolution mutually concentric with a second axis intersecting said first axis at a point of axes intersection;

support means rotatable on said first axis and journalled with said second concentric surface of revolution to support said nutating member for movement of said second axis in a biconical path having a central apex coincident with said point of axes intersection;

a pair of oppositely convergent cone-like members coupled for rotation with said first shaft and spaced equidistantly from said point of axes intersection on said first axis, said cone-like members being in rolling engagement with said first surface of revolution on said nutatable member;

at least one piston reciprocable in a cylinder defined by said frame and having one end face spaced from said piston;

means interconnecting said piston and said nutating member to drive said second axis in said biconical path upon piston reciprocation to rotate said support member in one direction of rotation on said first axis and to rotate said first shaft in an opposite direction of rotation at a rotational speed determined by the radii of said cone-like members at points of contact thereon with said first nutating member surface of revolution;

means to vary the angle of said first and second axes intersection for in phase adjustment of both the distance of piston reciprocation and the rotational speed of said first shaft between minimum and maximum values for a given frequency of piston reciprocation; and

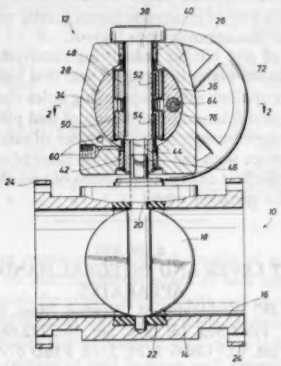
an epicyclic gear train having torque output means and two torque input means, said first shaft being connected to one of said torque input means and said support member being connected to the other of said two torque input means.

4,100,816

MANUAL CONTROL APPARATUS

Malcolm D. Clark, 4 St. Ronans Drive, Glascow G413 SJ, Scotland

Filed Oct. 22, 1976, Ser. No. 734,828
Claims priority, application United Kingdom, Nov. 29, 1975, 49136/75
Int. Cl.[2] F16H *27/02, 29/20;* F16K *31/53;* F15B *13/10*
U.S. Cl. 74—89.14 22 Claims



1. An actuator and override mechanism comprising:
a housing having a chamber therein;
a drive member disposed in said chamber for movement therein;
an elongate torque transmission member rotatably mounted in said housing and extending into said chamber;
an annular connector disposed at least partially between said torque transmission member and said drive member, said connector being connected to said torque transmission member for longitudinal but non-rotating movement therealong and threadedly connected to said drive member for relative movement of said drive member and said connector upon rotation of said torque transmission member;
means fixing said torque transmission member against longitudinal movement with respect to said housing;
a pair of spaced stop means for limiting longitudinal movement of said connector along said torque transmission member;
and means for rotating said torque transmission member.

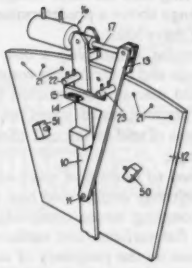
2. An actuator and override mechanism comprising:
a housing having a chamber therein;
a drive member disposed in said chamber for reciprocation therein;
an elongate torque transmission member rotatably mounted in said housing and extending into said chamber, the axis of said torque transmission member being generally parallel to the path of said drive member, and said drive member being telescopically mounted on said torque transmission member for said reciprocation;
an annular connector disposed at least partially between said torque transmission and said drive member, said connector being connected to said torque transmission member for longitudinal but not rotating movemment therealong and threadedly connected to said drive member for relative longitudinal movement of said drive member and said drive member and said connector upon rotation of said torque transmission member;
means fixing said torque transmission member against longitudinal movement with respect to said housing;
a pair of spaced stop means for limiting longitudinal movement of said connector along said torque transmission member;
and means for rotating said torque transmission member.

4,100,817

AUTOMATIC INDEXING MECHANISM

Peter Ryan, and Harry Bradley, both of Burnley, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 14, 1976, Ser. No. 676,689
Int. Cl.[2] F16H *27/00*
U.S. Cl. 74—111 6 Claims



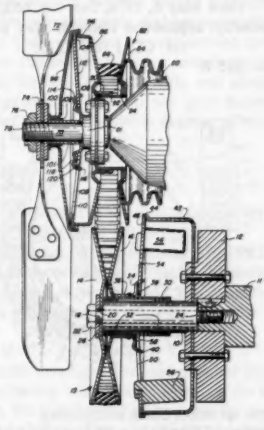
1. An automatic indexing mechanism comprising a plate and a member mounted for relative pivotal movement, a row of spaced locations on said plate, first and second stops movable into and out of engagement with said locations on said plate, said first stop being mounted for movement with said member, an element movably attached to said member and movable relative thereto to a limited extent, said second stop being mounted for movement with said element, reciprocating means for effecting relative movement between said member and said element, and control means for controlling the reciprocation of said reciprocatable means and movement of said members and said element and thereby said first and second stops and the engagement of said stops with said plate so as to cause reciprocation of said reciprocatable means while one of said first and second stops is engaged and the other of said first and second stops is disengaged in a manner to effect relative movement between said plate and said member.

4,100,818

DRIVE SYSTEM

Gary A. Woollard, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 13, 1976, Ser. No. 722,937
Int. Cl.[2] F16H *9/00*
U.S. Cl. 74—230.17 E 6 Claims



1. Apparatus for driving accessories disposed between a

drive shaft connected to an engine in a vehicle and a driven shaft connected to one or more accessories; the combination comprising:

a first variable pulley rotationally associated with the drive shaft and having a fixed flange connected to the drive shaft and a movable flange movable axially of said fixed flange and the drive sahft;

means for moving said movable flange axially away from said fixed flange above a predetermined speed above zero speed of the drive shaft;

said moving means comprising a disc spring biasing said movable flange and centrifugally responsive means associated with said disc spring actuated by centrifugal force above said predetermined speed of the drive shaft to change the bias of said spring and effect movement of said movable flange;

means connected to said drive shaft and constructed with means to positively couple said disc spring to said drive shaft, said coupling means comprising at least a pair of cooperating flat surfaces, one surface on said conrected means and one on the periphery of said disc spring;

a second variable pulley rotationally associated with the driven shaft and the accessories and having a fixed flange connected to the driven shaft and a movable flange movable axially of said fixed flange and said driven shaft;

disc spring means urging said movable flange of said second pulley axially toward said fixed flange thereof;

means connected to said driven means and constructed with means to positively coupled said disc spring means to said driven shaft, said coupling means comprising at least a pair of cooperating flat surfaces, one surface on said last-named connected means and one on the periphery of said disc spring means;

drive means between said variable pulleys effective to provide the drive therebetween with the drive ratio between the pulleys determined by the position of the movable flanges with respect to their respective fixed flanges;

said apparatus being constructed and arranged to provide substantially a fixed ratio drive between the drive and driven shafts at relatively low drive shaft speeds and also to provide substantially a constant speed of the driven shaft for speeds for the drive shaft above said predetermined speed thereof throughout the major portion of the normal vehicle operating range.

4,100,819

ARRIS SPROCKET CHAIN

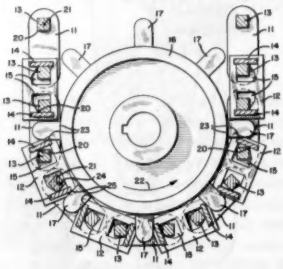
Erkki Topias Lehtola, Kaskinen, Finland, assignor to Oy Tahka AB, Kaskinen, Finland

Filed May 6, 1976, Ser. No. 683,904

Claims priority, application Finland, May 14, 1975, 751420

Int. Cl.[2] F16G *13/00*

U.S. Cl. 74—245 R **3 Claims**



1. An arris sprocket chain comprising

(a) a plurality of first links each including a pair of longitudinal plates interconnected in spaced relation by a pair of fulcrum pins fixedly secured to said plates adjacent the opposite ends thereof,

(b) means on each of said pins defining an arris extending parallel with the axis of said pin and lying outside the center line connecting the axes of said pair of pins and within the space between lines extending through said pin axes normal to said center line,

(c) a plurality of second links alternating with said first links,

(d) each of said second links comprising a pair of longitudinally extending side plates interconnected in spaced relation by a pair of transverse plates fixedly secured thereto adjacent the opposite ends thereof,

(e) each of said second links being received between said longitudinal plates of a pair of said first links, and

(f) said second link side plates having holes therein receiving one of said fulcrum pins of each of said pair of first links freely therethrough with said arrises of said pins in pivoting contact with the opposed surfaces of said transverse plates to effect change in the pitch of said chain in passage around a sprocket wheel.

4,100,820

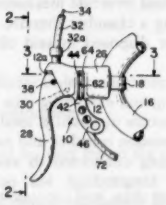
SHIFT LEVER AND INTEGRAL HANDBRAKE APPARATUS

Joel Evett, 287 Washington St., Newton, Mass. 02158

Filed Sep. 13, 1976, Ser. No. 722,685

Int. Cl.[2] G05G *1/24, 5/16;* **F16D** *67/00*

U.S. Cl. 74—489 **12 Claims**



1. A shift apparatus and integral handbrake assembly adapted to mount on a handlebar comprising handbrake bracket means on which pivots a handbrake lever, a pivotal shift lever integrally carried by said handbrake bracket, said shift lever having one end formed as a shift barrel and the other end formed as a finger paddle, said handbrake bracket being formed with a slot and having an interior region formed with partition means on which said shift barrel pivotally mounts, the last-mentioned mounting being such that a portion of said shift lever is disposed through said slot thereby to place said handle extending from said handbrake bracket, means for coupling said shift lever to a Bowden cable, and means for placing a controlled drag on said shift barrel whereby pivoting said finger paddle operates to provide the mechanical advantage necessary to overcome the drag placed on said shift barrel and thereby effect a relative lengthening or shortening of the Bowden cable.

4,100,821

MULTISTAGE GEAR CONTROLLING MECHANISM

Michael Geiger, Starnberg, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed Nov. 8, 1976, Ser. No. 739,734

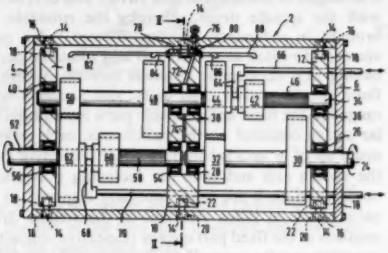
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1975, 2551934

Int. Cl.[2] F16H *57/02*

U.S. Cl. 74—606 R **10 Claims**

1. In a multistage gear controlling mechanism which is arranged in a gear housing having several walls which are arranged one behind the other for supporting the gear shafts, the improvement comprising wherein the walls are con-

structed as individual support plates separate from the gear housing and which are mounted in the gear housing, said support plates having unfinished peripheral edge surfaces and being smaller in dimension than the inside dimension of said housing to define a gap therebetween encircling said support plates, first means defining a plurality of recesses in said peripheral edges of each of said individual support plates, second



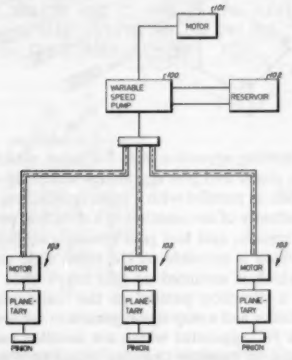
means defining openings through the walls of said housing, said recesses on said peripheral edges of said support plates being positionable for axial alignment with said openings, index bolt means supported in said housing walls for fixedly locating said support plates in said housing, said index bolt means extending from outside of said housing wall laterally inwardly across said gap and into said recesses in said peripheral edge surfaces of said support plates.

4,100,822

DRIVE SYSTEM FOR A MOVING MECHANISM

Allan Rosman, Dr Fleming 51, Madrid 16, Spain

Filed Apr. 19, 1976, Ser. No. 678,434
Int. Cl.[2] F16H *37/06, 47/00;* F16D *31/02;* B66D *3/16*
U.S. Cl. 74—674 **86 Claims**



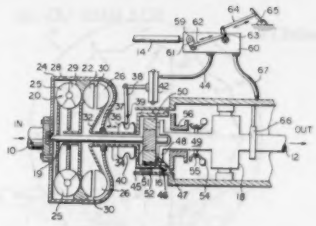
1. A drive system comprising:
a. a pair of annular members,
b. each said annular member being laterally spaced with respect to each other and carrying first engagement means,
c. means disposed adjacent each annular member for rotatably mounting the annular members,
d. drive motor means disposed adjacent to each annular member of said pair and carrying second engagement means which couple to the first engagement means on each said annular member, and
e. means for operating the drive motor means to move each of the annular members about an axis of rotation.

4,100,823

AUTOMATIC TRANSMISSION

John Krist, 618 Tedwyn Dr., Mississauga, Ontario, Canada (L5A 1K2)

Filed Apr. 5, 1976, Ser. No. 673,921
Int. Cl.[2] B60K *41/16*
U.S. Cl. 74—863 **4 Claims**



1. An automatic transmission for engines and vehicles having an engine crankshaft and a vehicle drive shaft, comprising transmission housing means, power input shaft means journaled in said transmission housing means for delivering power from said engine crankshaft, torque converter means in said housing means for receiving power from said input shaft means including fluid coupling unit means, said fluid coupling unit means including primary and secondary torque converter means, first impeller means, first turbine means for being driven by said first impeller means, second impeller means, second turbine means for being driven by said second impeller means, regulating means for regulating the transmission of power from said impeller means to said respective turbine means, planetary gear system means including a plurality of intermeshing gear means rotatable by power derived from said engine crankshaft, vacuum controlled means capable of connection to said engine for controlling the operation of said torque converter means and said gear system means, said vacuum control means including operation regulating housing means, first vacuum sensing duct means connectable to said regulating housing means from the engine manifold of said engine for sensing the vacuum existing therein under varying engine drive conditions, vacuum actuator diaphragm means connected to said operation regulating housing means for being actuated by varying conditions in said engine manifold, linkage lever means for coupling said vacuum actuator diaphragm means with said second turbine means for regulating the interspacing between said second impeller means and said second turbine means for regulating the torque produced therebetween, said second turbine means including second turbine shaft means movable with said second turbine means, annular ring gear means carried by said second turbine shaft means for rotation therewith, sun gear means carried by said input shaft means for rotation therewith, and planetary gear system means engageable with said sun gear means and said ring gear means for mutual adjustable degrees of intercoupling thereof.

4,100,824

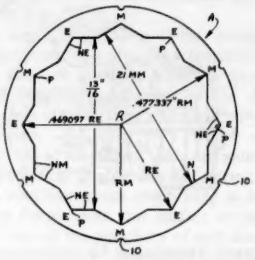
ROTARY TOOL FOR DRIVING ENGLISH AND METRIC THREADED MEMBERS

Jon V. Marschke, Cloquet, Minn., assignor to SURELAB Superior Research Laboratories, Inc., West St. Paul, Minn.

Continuation-in-part of Ser. No. 554,721, Mar. 3, 1975, abandoned. This application Jun. 4, 1976, Ser. No. 693,103
Int. Cl.[2] B25B *13/06*
U.S. Cl. 81—121 R **3 Claims**

1. A rotary tool for driving a threaded member such as a nut or bolt or the like having a head sized in either the English or the metric system, the tool having an opening for reception of the head of the threaded member, the opening having a first set of six notches equally spaced about its periphery and sized for

engagement with the English-sized head of a threaded member, and having a second set of six notches interposed between the notches of the first set and sized for engagement with a metric-sized head of a threaded member, all of the notches being intersected by a plane normal to the axis of rotation of the tool, and the relationship of the English sized notches to the metric sized notches being given by the formula



$SM = 0.79375B$

wherein SM represents the number of millimeters in the metric system, and B is the number of 32nds of an inch in the English system, SM and B both being taken to nearest integers.

4,100,825

CONTROLS FOR MULTI SPINDLE LATHES

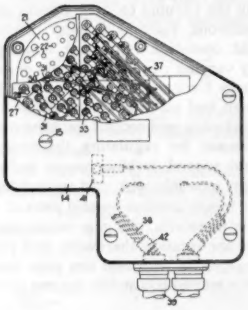
Edmund Alexander McConnell, Coventry; Norman Yearsley, Kenilworth, and Alec Gordon Blockley, Coventry, all of England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Dec. 7, 1976, Ser. No. 748,349

Claims priority, application United Kingdom, Dec. 13, 1975, 51170/75

Int. Cl.² B23B *3/34*

U.S. Cl. 82—3 **14 Claims**



1. A multi spindle lathe comprising:

a machine base;

a spindle drum mounted on the machine base;

drive means for indexing the spindle drum with respect to the machine base about an index axis in equal steps of $m/360°$, where m is a finite integer greater than unity, whereby the spindle drum is brought in succession into m different index positions;

n spindles, where n is a finite integer greater than unity and not greater than m, the spindles being mounted in the spindle drum and defining respective spindle axes which are all in the same orientation with respect to the index axis, and each pair of spindles which are adjacently disposed about the index axis being angularly spaced about the index axis by an angle which is an integral multiple of $m/360°$;

a plurality of electrical circuits associated with the spindle drum; and

a multi pole rotary electrical switch for controlling said electrical circuits and having a part which is fixed with respect to the machine base and a part which is rotatable with respect to the machine base about a switch axis and is arranged to index about said switch axis in synchronism with the spindle drum, whereby the rotatable part is brought in succession into m different index positions about said switch axis, the fixed and rotatable parts each having m.p cooperable contacts thereon, where p is a finite integer greater than unity, said contacts being arranged in the fixed and rotatable parts in respective circular arrays centered on the switch axis, each array being made up of m arcs subtending equal respective angles at the switch axis and each arc including p contacts, the contacts of each arc being similarly disposed so that at each of the m index positions of the spindle drum the contacts of the fixed part engage respective contacts of the rotatable part for controlling the electrical circuits respectively.

4,100,826

TOOL HOLDING APPARATUS IN AN NC LATHE

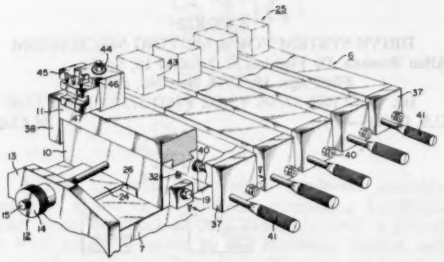
Taro Takahashi, No. 667-5, Oaza-Tsuchikawa, Ojiya-shi, Niigata-ken, Japan

Filed Aug. 8, 1977, Ser. No. 822,576

Claims priority, application Japan, Aug. 13, 1976, 51-97371

Int. Cl.² B23B *21/00, 3/00*

U.S. Cl. 82—25 **6 Claims**



1. A tool holding apparatus in an NC lathe, which comprises a cross slide; plural tool post assemblies which are mounted on said cross slide in parallel with a main spindle and to be movable independently of one another in a direction perpendicular to the main spindle, said tool post assembly including a lower slide post which is movable on the cross slide and an upper slide post which is mounted on said lower slide post and is movable in a direction parallel to the main spindle; an oil pressure cylinder and a stop signal generator for sending a stop signal to the NC apparatus which are installed on said lower slide post, said oil pressure cylinder including a piston which moves in the cylinder and is associated with the upper slide post; and a means provided in the upper slide post so as to actuate the stop signal generator at the termination of forward and backward stroke of said post.

4,100,827

BAR STOCK FEED TUBE ASSEMBLY

Norbert A. Flemming, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

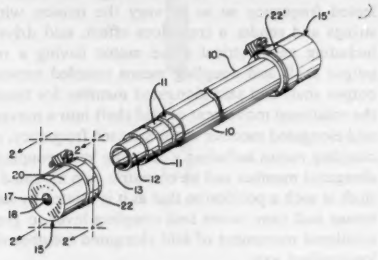
Filed Apr. 6, 1977, Ser. No. 784,984

Int. Cl.² B23B *25/00;* B23Q *5/22;* B65G *11/00;* F16L *11/00*

U.S. Cl. 82—38 A **7 Claims**

1. A bar stock feed tube assembly comprising an outer, substantially-tubular reinforcing jacket, an anechoic feed tube

of synthetic polymeric material mounted within the reinforcing jacket, a resilient sound-damping material disposed under compression between the feed tube and the reinforcing jacket,



and an end cap having an orifice adapted to receive bar stock mounted over the end of the feed tube to secure the anechoic feed tube within the reinforcing jacket.

4,100,828

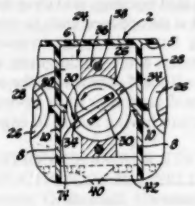
APPARATUS FOR RIB TRIMMING OF UNIVERSALLY MOLDED BATTERY CONTAINER

Robert H. Thune, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 715,070, Aug. 17, 1976, Pat. No. 4,041,603. This application May 19, 1977, Ser. No. 798,592

Int. Cl.² B26D *3/00, 3/28*

U.S. Cl. 83—1 **2 Claims**



2. A tool for trimming the cell-pack-retaining ribs of a battery case, said case comprising at least two opposed walls defined in part a cell compartment and a plurality of oversized ribs extending outwardly from said walls in opposed relation one to the other, said tool comprising: rotatable tubular blades including rib-shaving edges and adapted for insertion into said compartment with said edges aligned with said ribs and spaced from said walls for uniformly shaving back said ribs to a predetermined elevation beyond their associated wall; guide means rotatably journalling said blades and adapted to engage said walls immediately adjacent said ribs for maintaining said spacing between said blades and walls throughout the full extent of the tool's insertion; and shearing means on said guide means adjacent said edges for cooperating with said rotatable blades to snip off shavings produced at the bases thereof.

4,100,829

APPARATUS FOR SHEARING METALLIC BARS

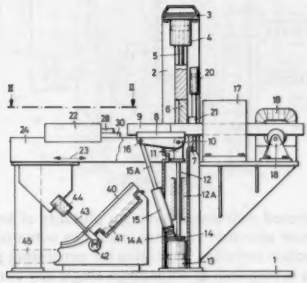
Ernst Stangl, Remscheid-Reinshagen; Rolf Gies, Remscheid-Goldenberg; Hans-Jürgen Model, and Edgar Stengel, both of Remscheid, all of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid-Hasten, Germany

Filed Jun. 21, 1977, Ser. No. 808,629

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2631989

Int. Cl.² B26D *5/20*

U.S. Cl. 83—106 **4 Claims**



1. A shearing apparatus for shearing heated metal into bars comprising:

means for transporting said material in the longitudinal direction;

means for clamping said material in a shearing position;

stop means for limiting the longitudinal movement of said bars;

means for shearing a bar in the shearing position;

means behind said shearing means for exerting a force on said bar in said longitudinal direction; and

means for detecting movement of said bar from said force to indicate that the bar is incorrectly dimensioned.

4,100,830

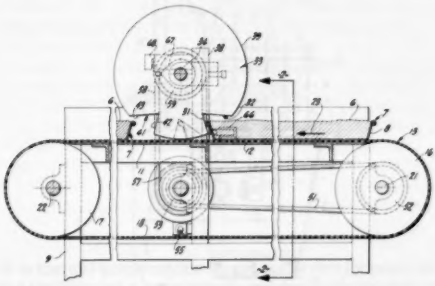
SHEET CAKE CUTTER

Charles Lakatos, San Francisco, Calif., assignor to Fantasia Confections, Inc., South San Francisco, Calif.

Filed Sep. 2, 1977, Ser. No. 830,195

Int. Cl.² B26D *4/04, 4/16, 3/22*

U.S. Cl. 83—371 **8 Claims**

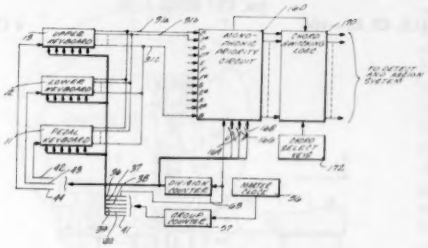


1. A sheet cake cutter comprising a frame, a conveyor on said frame adapted to advance on said frame a pan having a rim and containing a sheet cake, a cutter disc having therein an edge notch interengageable with said rim, and means on said frame for mounting said disc for rotation relative to said frame with said disc extending into said pan and said edge notch in interengagement with said rim.

4,100,831
AUTOMATIC DIGITAL CIRCUIT FOR GENERATING CHORDS IN A DIGITAL ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Aug. 9, 1976, Ser. No. 712,736
Int. Cl.[2] G10H *1/00, 3/06*
U.S. Cl. 84—1.01 6 Claims

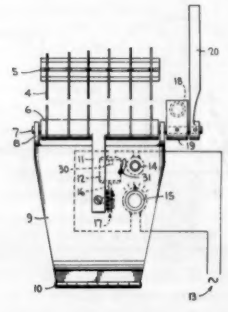


1. In a keyboard instrument having a plurality of keys and a plurality of note selection switches, each key actuating one of said note selection switches, apparatus for generating predetermined chords in response to actuating a single key comprising:
means connecting the note selection switches in groups, the switches in each group corresponding to the notes in one octave, means including the switches in each group for selectively connecting a signal to an associated one of a plurality of output lines when a key in the group is operated, there being one output line for each note in the group, input chord control means generating signals coded to indicate a selected one of a plurality of different types of musical chords, switching logic means responsive to a signal on any one of said output lines and to the coded signals indicating a particular type of chord for selectively coupling said signal on one of said output lines to particular additional ones of said output lines corresponding to the notes in the particular chord, and means responsive to the signals on said output lines for generating corresponding tones within an octave.

4,100,832
TREMOLO FOR A STRING INSTRUMENT

James R. Peterson, Rte. 1, Box 664, Wilton, Calif. 95693

Filed Jul. 26, 1976, Ser. No. 708,427
Int. Cl.[2] G10D *3/12*
U.S. Cl. 84—313 8 Claims

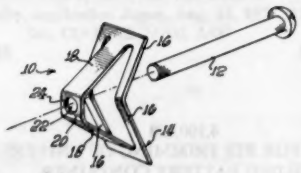


1. A tremolo for a string instrument having a plurality of strings stretched across a body, the tremolo comprising:
a movable elongated member coupled to the strings at one of their ends and having its longitudinal axis extending along an axis transverse to the strings and said elongated member being rotatable about its longitudinal axis so as to be movable in a direction transverse to its longitudinal axis; and,
drive means for automatically moving said movable member in a direction transverse to its longitudinal axis at a selected frequency so as to vary the tension within the strings and render a tremulous effect, said drive means including an electrical drive motor having a rotatable output shaft and coupling means coupled between said output shaft and said elongated member for transferring the rotational movement of said shaft into a movement of said elongated member at the selected frequency, and said coupling means including a coupling lever coupled to said elongated member and an eccentric cam mounted on said shaft in such a position so that as it is rotated by said drive means said cam causes said coupling lever to generate a rotational movement of said elongated member about its longitudinal axis.

4,100,833
BLIND FASTENER

Christopher Eric Nessa, 24732 Glenwood Dr., El Toro, Calif. 92630

Filed Jun. 27, 1977, Ser. No. 810,175
Int. Cl.[2] F16B *35/04*
U.S. Cl. 85—3 S 13 Claims



1. A blind fastener formed of a single piece of resilient sheet material, said blind fastener comprising a base, said base being of V-shape in longitudinal cross-section to provide a pair of wings, said base comprising an outer frame of said sheet material and an internally disposed opening, a strap integral with said base and overlying said opening, said strap being a strip of said material connected at its opposed ends to said outer frame and extending inwardly from said wings to provide opposed columns disposed at more acute angles than said wings, a cental portion integral with and connecting the adjacent outer ends of said columns, said central portion having an aperture therethrough, said aperture having means to engage the shank of a cooperating bolt.

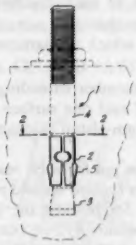
4,100,834
CONTROLLING HARDNESS OF ANCHOR BOLT EXPANSION SLEEVES

Frederick John Harris, Clinton, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 10, 1976, Ser. No. 749,599
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—77 2 Claims

1. An anchor for use in a pre-drilled hole in masonry or the like, said anchor including a sleeve structure of a work hardenable material having a Brinell hardness number in the range of 100 to 230 expandable into contract with the side of said hole, said sleeve including one or more extruded external protuberances adapted to initially engage the sidewall of said hole, said sleeve being annealed from an initial hardness exceeding a 230 Brinell hardness number to said Brinell hardness number in the range of 100 to 230 to reduce the effect of work hardening

occasioned by the fabrication process, thereby allowing flattening of said protruberances and facilitating full area engagement of said sleeve with the side of said hole whereby formation of localized areas of stress concentration is prevented.



4,100,835

BRAIDED PACKING

Peter F. Kozlowski, Billerica, Mass., assignor to A. W. Chesterton Company, Stoneham, Mass.

Filed Dec. 27, 1976, Ser. No. 754,254
Int. Cl.[2] D04C *1/06*
U.S. Cl. 87—1 **9 Claims**

1. Braided packing comprising a plurality of outer core strands extending generally axially along said packing and a plurality of braid strands braided together about said core strands, said outer core strands extending helically along said packing and forming with said braid strands a braid having a normal helical twist in one direction and said braid strands extending over said core strands in a continuous helical pattern in a direction opposite said one direction.

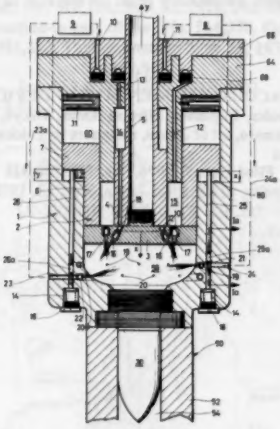
4,100,836

COMBUSTION CHAMBER SYSTEM FOR THE PRODUCTION OF PROPELLING GASES

Heinrich Hofmann, Gröbenzell, Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Germany

Filed Sep. 22, 1969, Ser. No. 862,638
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1968, 1728074
Int. Cl.[2] F41F *1/04*
U.S. Cl. 89—7 **7 Claims**

1. A driving force generating system, particularly for propelling a device such as a projectile in a fire arm, comprising wall means defining a combustion chamber, a piston movable in said combustion chamber, propellant component supply tank means, pump means connected between said supply tank means and said combustion chamber and being operable by movement of said piston in a working stroke to deliver propellant components into said combustion chamber, additional propellant supply means connected between said propellant supply tank means and said combustion chamber, nozzle means associated with said supply means for discharging the propellant into said combustion chamber, a control member disposed in the path of said piston, a spring biasing said control member in a direction to project it into the path of movement of said piston, said control member being contractable by said piston in a return movement to move it against the force of said spring to cause the discharge of propellant from said nozzle means for directing an additional amount of propellant components from said supply tank means into said combustion chamber toward the end of the return movement of said piston.

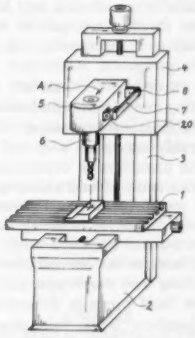


4,100,837

TEMPERATURE COMPENSATED MEASURING DEVICE

Walter Köhler, Gütersloh, Germany, assignor to Norte-Klessmann & Co. K.G., Gutersloh, Germany

Filed Dec. 21, 1976, Ser. No. 752,963
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558625
Int. Cl.[2] B23C *7/00*; B23B *49/00*
U.S. Cl. 90—11 R **9 Claims**



1. A thermal compensation measuring device for positioning on an arm between a cutter spindle and frame of a machine tool comprising at least one steel rod, first means fixed to one end of said steel rod and adopted to be connected to said arm for supporting the steel rod in the direction of the arm, at least one aluminum rod, second means fixed to one end of said aluminum rod and to the other end of said steel rod, said second means supporting said aluminum rod parallel to the steel rod with its other end extending toward said one end of the steel rod, a further steel rod, third means fixed to one end of said further

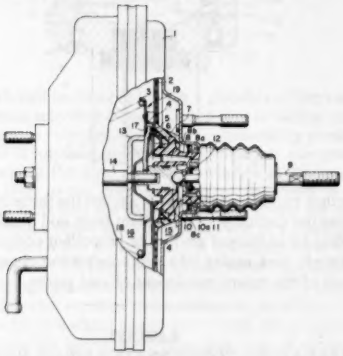
steel rod and to the other end of said aluminum rod, said third means supporting said further steel rod to be mutually parallel with the steel and aluminum rods with its other end extending toward said one end of the aluminum rod, and measuring means connected near the other end of said further steel rod for interacting with a stationary point on the arm of the machine tool.

4,100,838

VACUUM AUGMENTATION DEVICE

Kiyoshi Tateoka, Fujisawa; Hiromi Ando, Tokyo, and Tomizo Azuma, Yamato, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 7, 1976, Ser. No. 748,321
Claims priority, application Japan, Dec. 13, 1975, 50-148598
Int. Cl.[2] F15B *9/10*; F01B *31/12*
U.S. Cl. 91—1 **7 Claims**



1. A vacuum augmentation device of the type usable with a push rod actuated vehicle braking system and having

a hollow body,

a plunger assembly shiftably mounted in said body and actuatable by said push rod for movement of said plunger assembly from a standby to an operated position thereof in response to actuation of said push rod,

an output rod shiftably mounted in said body to be moved with augmented force in response to movement of said plunger assembly to its operated position,

a shiftable diaphragm-piston mechanism mounted in said body between a pair of fluid chambers within the latter,

means for subjecting one of said chambers to a fluid pressure different from atmospheric pressure,

valve means operably associated with said plunger assembly for placing said chambers in communication with each other to maintain both of said chambers at substantially the same fluid pressure when said plunger assembly is in its standby position, and for isolating said chambers from fluid communication with each other and placing the other of said chambers in communication with the atmosphere for shifting said diaphragm-piston mechanism in response to the fluid pressure differential presented between said chambers when said plunger assembly is moved to its operated position,

a generally cup-shaped fulcrum plate mounted on said output rod for transmitting a force to the latter for moving the same and having an edge portion generally concentric with the axis of said output rod and facing in a direction generally toward said plunger assembly and said diaphragm-piston mechanism,

a number of reaction levers extending generally radially with respect to the axis of said output rod, each having a pair of oppositely facing side surfaces, and each disposed with a radially inner portion of one of said surfaces engageable by said plunger assembly and a radially intermediate portion of the other of said surfaces engageable with said edge portion of said fulcrum plate,

and means for operably coupling a radially outer portion of said one surface of each reaction lever with said diaphragm-piston mechanism,

the improvement of which is characterized by said coupling means including:

a mounting plate member extending between said radially outer portion of said one surface of each reaction lever and said diaphragm-piston mechanism and in engagement with the latter;

an elongate fulcrum pin for each reaction lever; and

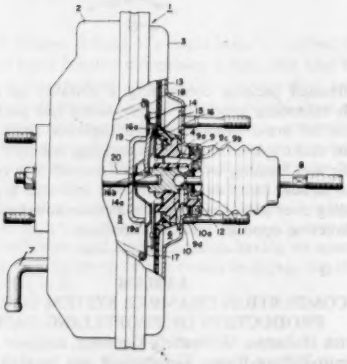
pin retention means formed on said mounting plate for each pin respectively for holding the latter in disposition for longitudinal, substantially line contact of an intermediate portion of said pin between its ends with said radially outer portion of said one surface of the corresponding reaction lever.

4,100,839

VACUUM AUGMENTATION DEVICE

Hiromi Ando, Tokyo, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 10, 1976, Ser. No. 749,306
Claims priority, application Japan, Apr. 13, 1976, 51-45740[U]
Int. Cl.[2] F15B *9/10*; F01B *19/00*; F16J *3/02*
U.S. Cl. 91—369 B **3 Claims**



1. A vacuum augmentation device having a diaphragm which divides a shell body into two chambers and, in one operating condition of the device, receives a differential pressure on the opposite sides of said diaphragm, said differential pressure being transferred to one face of a plurality of reaction levers through a piston plate and then to an output rod to produce a reaction force which is transferred back to the other face of said reaction levers and then to an input rod, characterized in that a metal mounting plate is interposed between said piston plate and said reaction levers, there is a pin for serving as a fulcrum for each of said reaction levers, and said metal mounting plate is provided with pin retention pawls oppositely juxtaposed with the sides of said pins to position the same with respect to said reaction levers and with pin engaging pawls for engaging end portions of said pins to prevent the pins from coming off said metal mounting plate member.

4,100,840

RADIAL PISTON MACHINE

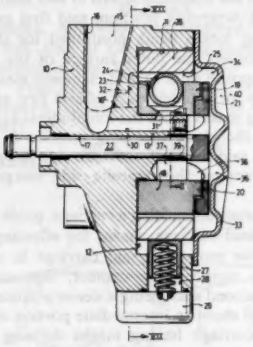
Paul Bosch, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 742,125

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552442

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—491 9 Claims



1. A radial piston machine comprising a housing having a control trunnion integrally formed therewith and an annular portion surrounding said control trunnion radially spaced therefrom to form an annular chamber open at one side; a cover closing the open side of said chamber; a rotor rotatably mounted on said control trunnion and having a plurality of radial bores having open inner and outer ends; a plurality of pistons respectively slidable in said bores and having outer ends projecting through said open outer ends of said bores beyond the outer periphery of said rotor; a displacement ring in said chamber eccentrically arranged with respect to said rotor and having an inner surface engaged by the outer ends of said pistons to move the latter during rotation of said rotor between suction and compression strokes, said inner surface of said displacement ring being radially spaced from the outer surface of said rotor and forming therewith a radial gap of varying height; an inlet channel in said housing on the side of said rotor opposite of said cover; passage means in said housing providing communication between said inlet channel and said gap; a suctions slot in said trunnion communicating during rotation of said rotor with the inner ends of those bores in which the pistons move radially outwardly along the suction stroke; a cross-slot in said trunnion opposite said suction slot and communicating during rotation of said rotor with the inner ends of those bores in which the pistons move radially inwardly along the compression stroke; an outlet channel in said housing; at least one bore through said trunnion substantially parallel to the axis thereof and providing communication between said cross-slot and said outlet channel; an axial bore in said trunnion and a shaft extending through said axial bore and with one end thereof beyond the housing at the side of the latter opposite said cover; coupling means at the other end of said shaft for coupling the shaft to the rotor, said coupling means comprising a coupling disc, and said rotor and said coupling disc being provided with interengaging radial slots and ridges, said coupling disc having axial passages permitting flow of fluid therethrough into said suction slot; and channel means in said cover and providing communication between said gap and said suction slot, said channel means comprising an outer annular channel in the region of said gap, an inner annular channel in the region of said axial passages in said coupling disc, and a plurality of connecting channels displaced circumferentially from each other and providing communication between said outer and said inner annular channel.

4,100,841

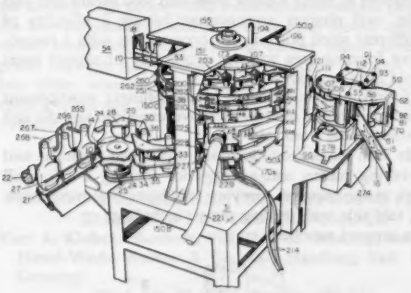
WEB HANDLING APPARATUS FOR PRODUCING SHRUNKEN PILFER-PROOF NECK LABELS FOR CONTAINERS

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 526,124, Nov. 22, 1974, Pat. No. 4,013,496, and a continuation-in-part of Ser. No. 514,370, Oct. 15, 1974, Pat. No. 3,951,292. This application May 25, 1976, Ser. No. 689,885

Int. Cl.[2] B31D *5/04;* B31F *7/00*

U.S. Cl. 93—1 G 6 Claims



1. Web handling apparatus comprising

pull roll means in engagement with a web of flexible organic thermoplastic material for moving the web in a longitudinal forward direction,

power means connected to said pull roll means for driving the latter,

a web scoring device through which said web is reeved comprising

a scoring back-up roll rotatable about a central longitudinal axis,

a knife element,

a knife holder supporting the knife element,

adjustable support means for said knife holder adjacent said scoring back-up roll holding the knife element normal to the axis of said scoring back-up roll and yieldable in a direction away from the scoring back-up roll.

said knife element engaging the web at a longitudinal line of cut thereon in the direction of travel of the web, said support means holding the knife for partial depth slitting of the web to provide a score line along said line of cut, and

means engaging the scored web for providing cross-pleats therein comprising

a back-up roll having a relatively yieldable peripheral surface rotatably mounted on an axis for engaging the moving web, and

a rotary pleating tool rotatably mounted on an axis parallel to the axis of said last mentioned back-up roll, said pleating tool including an elongated tip extending substantially across said web width and engaging said web for compressing the web material against said back-up roll.

4,100,842

APPARATUS FOR FORMING A CONTAINER

Frank P. Richards, Prairie Village, Kans.; Raymond C. Taylor, Grand View; Jerry W. Young, Weston, both of Mo., and Silvio T. Farfaglia, Fulton, N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1977, Ser. No. 798,197

Int. Cl.[2] B31B *17/02*

U.S. Cl. 93—39 C 8 Claims

1. An apparatus for forming a container having a side wall and a bottom closure member, said apparatus including:

(a) a support;

(b) conveying means mounted on said support and being

operable for conveying a mandrel from one station of the apparatus to an adjacent station of the apparatus;

(c) bottom closure forming means positioned adjacent said conveying means and adapted for forming a bottom closure member and transferring same to said mandrel, said bottom closure forming means including:

(1) a forming die having a plurality of different sized forming areas;

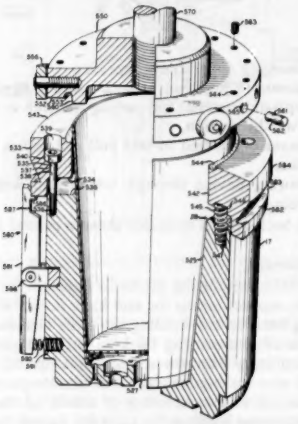
(2) feed means cooperating with said forming die and being operable for feeding bottom blanks to said forming die;

(3) a plunger arrangement positioned adjacent said die and adapted to move a blank from said feed means into said die, said plunger arrangement having a plurality of different sized portions for cooperating with a respective forming area to form a plurality of sapced apart fold lines on said blank; and

(4) fourth means connected to said plunger arrangement and operable to selectively move same into said die and retract same from said die;

(d) side wall blank feeding means positioned adjacent said conveying means and adapted for feeding a side wall blank to the mandrel carrying said bottom closure member, said side wall feeding means including:

(1) a support member;



(2) a first arm means pivotally mounted on said support member and having a free end;

(3) a second arm means pivotally mounted on said support member and spaced from said first arm means and having a free end;

(4) a first member pivotally connected to said first arm means and second arm means adjacent the respective free ends;

(5) a feed member mounted on said first arm means and movable therewith, said feed member is spaced from a portion of said first member forming a side wall blank receiving throat therebetween, said feed member being operably connected to drive means for effecting operation thereof;

(6) conveying means positioned adjacent said feed member and operable for conveying a side wall blank fed by the feed member through the throat to a point of use, said conveying means being operably connected to drive means for effecting operation thereof;

(7) a magazine for storing a plurality of side wall blanks;

(8) heating means adapted for heating side marginal portions of said side wall blank;

(e) wrapping means positioned adjacent said conveying means and adapted for wrapping a side wall blank about a mandrel carrying same and overlapping the side marginal portions thereof and holding the side overlapped marginal portions in engagement with one another for securing same together, said wrapping means including:

(1) a clamping means associated with each of said mandrels to hold an intermediate portion of a blank therebetween;

(2) first and second folding wing means each of said first and second folding wing means having a frame, a wiping blade, and means for resiliently mounting the wiping blade in the frame for movement of the blade along the line radial to the longitudinal axis of said mandrel when said a blank wrapping position; said first and second folding wing means being positioned for the wiping blades to contact the outer surface of the thus held blank on opposite sides of said clamping means;

(3) fifth means for rotating each of said first and second folding wing means about the longitudinal axis of a said mandrel in the blank wrapping position to wrap the blank about said mandrel with one side margin of said blank overlapping the opposite side margin of said blank; and

(4) said fifth means comprising a carriage, guide means for supporting said carriage, means for effecting forward and retractive motion of said carriage in said guide means in a reciprocating manner, first and second shafts, said second shaft being a sleeve positioned coaxially with and about an intermediate portion of said first shaft, said carriage having means defining first and second slots therein extending at least generally transversely to said direction of the reciprocating motion, a first slide element positioned in said first slot in operative engagement therewith, means connecting said first slide element to said first shaft for smoothly rotating said first shaft responsive to movement of said first slide element transfer sleeve to said direction of the reciprocating motion, a second slide element positioned in said second slot in operative engagement therewith, and means connecting said second slide element to said second shaft for smoothly rotating said second shaft responsive to movement of said second slide element transversely to said direction of the reciprocating motion;

(f) container bottom forming means positioned adjacent said conveying means and adapted for reverse bending a portion of the side wall blank over a skirt portion of the bottom closure member and moving same into engagement with one another for securing same together;

(g) bead forming means positioned adjacent portion of said conveying means and adapted for forming a bead on an edge of a partially formed container at the open end thereof, said bead forming means including:

(1) a container receiving recaptacle having an open free end with a first surface defining the free end, said receptacle having a container receiving pocket therein extending inwardly from the open free end;

(2) a ring having a through bore communicating with said pocket, said ring also having second and third surfaces with said second surface being adjacent said first surface;

(3) first means movably mounting said ring on said receptacle wherein said ring is movable between an extended position away from said receptacle and a retracted position adjacent said receptacle with said first means also biasing said ring to the extended position, said ring having an annular first groove recessed in said third surface;

(4) latch means cooperating with said ring and operable to releasably retain said ring in its retracted position;

(5) second means cooperating with said latch means for selectively releasing same from retaining said ring in its retracted position;

(6) a forming head positioned adjacent said ring and having a fourth surface with an annular second groove therein selectively cooperating with said first groove to form a substantially enclosed bead forming groove; and

(7) third means having said forming head mounted on a portion thereof, said third means being operable for rotating said forming head and for selectively moving said forming head between an extended position adjacent to and engaging said ring and a retracted position remote from said ring.

4,100,843
METHOD AND APPARATUS FOR ERECTING FOLDED BLANKS

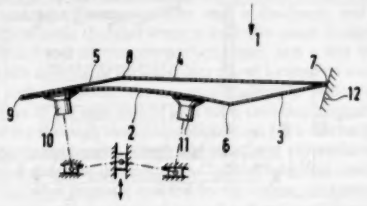
Walter Dietrich, Auenwald, and Manfred Bauer, Weinstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 767,861

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2606017

Int. Cl.² B31B *1/80*

U.S. Cl. 93—53 M **6 Claims**



1. A method for opening and erecting a tubular, substantially flat blank, especially a folded box blank having pairs of sides of different length, comprising the steps of:

advancing plural suction elements into a position to engage one long side wall of said flat blank;

applying vacuum to said suction elements;

retracting said plural suction elements together with said side wall of said flat blank to begin erecting said flat blank;

moving said flat blank into engagement with a stop means; and

continuing to pull said flat blank into a fully opened erect state.

4,100,844
BOX BLANK PUNCHING TOOL

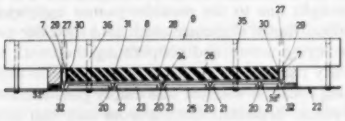
Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to R & S Stanzformen GmbH, Bergen-Enkheim, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,747

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1975, 7519878[U]; Oct. 15, 1975, 2546082

Int. Cl.² B31B *1/20*

U.S. Cl. 93—59 ES **6 Claims**



1. In a punching tool for making folding box blanks, including a male die member having a support base plate with punching knives secured to said support base plate, said punching knives defining the contours and cut lines of said blanks, with embossing projections also supported by said support base plate, and with a female die member with grooves therein arranged for cooperation with said male die member, the improvement comprising embossing plate means, said embossing projections extending from said embossing plate means in the same direction as said punching knives, said embossing plate means being movably held by said support base plate within the contour defined by said punching knives, elastic means interposed between said embossing plate means and said support base plate so that said embossing projections extend beyond the plane defined by the cutting edges of the punching knives when the elastic means are uncompressed, said female die member comprising a female plate member with raised fields thereon, said raised fields being spaced from each other to define said grooves which cooperate with said embossing projections, said punching knives comprising chamfers forming a cutting edge proper and a portion of uniform and reduced cross-section immediately adjacent to said chamfers forming the cutting edge proper, said reduced cross-section permitting the free movement of said embossing plate means, said elastic means comprising a compressible rubber elastic layer interposed between said embossing plate means and said support base plate, whereby the embossing plate means serves as an ejector when said rubber elastic layer expands after it has been compressed.

4,100,845
METHOD AND MACHINE FOR PRODUCING FILTER ELEMENTS FOR TOBACCO SMOKE

Kurt A. Körber, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Apr. 27, 1976, Ser. No. 680,722

Claims priority, application Luxembourg, May 15, 1975, 72749

Int. Cl.² A24C *5/50*

U.S. Cl. 93—77 FT **21 Claims**

1. A method of producing and processing a continuous filter rod, comprising the steps of conveying a continuous web of flexible material, particularly paper, lengthwise along a predetermined path; partially removing from the moving web a plurality of lugs which continue to adhere to the web and deflecting the lugs to one side of the web, said removing step comprising providing the web with incisions surrounding openings which develop in the web as a result of said deflecting step; converting the web into a continuous multi-walled rod wherein an outer tubular wall surrounds an inner tubular wall and said lugs extend into the interior of said inner wall, said openings being provided in said inner wall and being surrounded by said outer wall; and subdividing said rod into discrete rod-like filter elements each of which contains a plurality of lugs, as considered in the axial and circumferential directions of the filter element, so that said lugs and said walls form a labyrinth for the flow of a gaseous fluid through the respective filter element.

4,100,846
METHOD OF FORMING FIBER CANS

Francis R. Reid, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

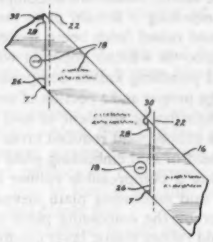
Filed Jun. 30, 1976, Ser. No. 701,315

Int. Cl.² B31C *3/00*

U.S. Cl. 93—94 R **4 Claims**

1. A method for forming a fiber can comprising providing an elongated winding mandrel, continuously winding a strip of fiber can body material onto the winding mandrel, continuously winding a strip of label material onto the strip of body stock material and just prior to applying the label strip to the body stock strip making a flying cut in the label by partially

severing the label strip to define a partial collar cut extending circumferentially of the cans being formed, said collar cut extending from one edge thereof in the direction of the opposite edge and having a termination point spaced from the opposite edge with a ligament of unsevered label material between the termination point and said opposite edge.

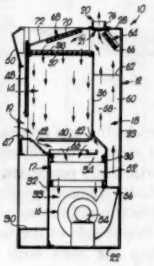


4,100,847

CONVERTIBLE, LAMINAR FLOW BIOLOGICAL SAFETY CABINET APPARATUS

Robert O. Norton, Chesterfield, Mo., assignor to Labconco Corporation, Kansas City, Mo.

Filed Dec. 20, 1976, Ser. No. 752,800
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 LH **4 Claims**



1. Biological safety cabinet apparatus, comprising:

upright cabinet structure including means defining a continuous air path allowing recirculation of air within the cabinet structure, a work compartment defining a portion of said path and located and arranged for generally vertical, downwardly directed airflow therethrough, a fresh air inlet communicating directly with said compartment, and an air discharge outlet;

means presenting a generally horizontally disposed work surface positioned within said compartment and adjacent said air inlet;

filter means located directly beneath said work surface for removing contaminants from air traveling along said path and preventing discharge of said contaminants through said outlet;

fan means below said filter means for pulling ambient air into said air path through said inlet and moving air along said path;

air diffuser means above said work surface and located in said air path for creating generally vertical laminar flow of air throughout the entirety of said compartment; and

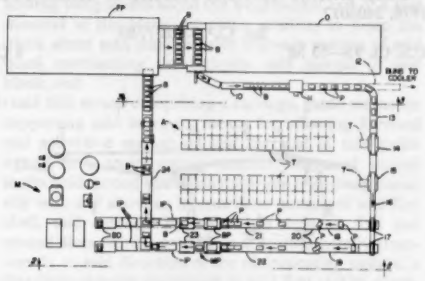
movable damper means adjacent said outlet for simultaneously varying the amount of air discharged from the outlet, the amount of fresh air introduced through said inlet, and the laminar flow characteristics of the air traveling through said compartment.

4,100,848

HIGH SPEED BUN PRODUCTION SYSTEM

Glenn R. Grissinger, York, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jun. 27, 1974, Ser. No. 483,830
Int. Cl.[2] A21B *7/00*
U.S. Cl. 99—353 **4 Claims**

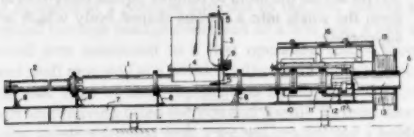


1. A high speed bun dough piece pan conveying and bun dough piece handling system, comprising an intermediate proofer having a vertical section and a horizontal section joined at one end thereof to an upper end of the vertical section and extending outwardly at its other end in spaced relation to the vertical section, dough piece conveying means in the intermediate proofer for receiving dough pieces and conveying them through the intermediate proofer to proof the dough pieces, a moulder-panner unit adjacent and spaced below said other end of the horizontal section of the intermediate proofer and receiving dough pieces from said intermediate proofer, said dough pieces being formed into bun dough pieces in said moulder-panner unit, said moulder-panner unit having rectilinear pan conveying means having a longitudinal axis and rectilinearly conveying pans toward said intermediate proofer vertical section, said moulder-panner unit having bun dough piece conveying means positioned to receive the bun dough pieces and to convey the bun dough pieces to a depositing location whereat said bun dough pieces are moved from said bun dough piece conveying means and deposited in an empty pan, and rectilinear empty pan conveyor means having a longitudinal axis and located adjacent said moulder-panner unit for rectilinearly conveying empty pans to said moulder-panner unit, said empty pan conveyor means extending in a substantially straight line to the moulder-panner unit, and being in longitudinal linear alignment with said moulder-panner unit pan conveying means and cooperating therewith to transfer said empty pan to a receiving location which is adjacent said depositing location whereat said empty pans receive said bun dough pieces deposited therein from said bun dough piece conveying means, said empty pan conveyor means being arranged to convey empty pans rectilinearly toward the intermediate proofer vertical section to deliver said empty pans to said moulder-panner unit pan conveying means adjacent said intermediate proofer horizontal section other end so that said empty pans are conveyed by said moulder-panner unit conveying means and said empty pan conveyor means toward said intermediate proofer vertical section along paths on said empty pan conveyor means and said empty pan conveying means which paths are longitudinally aligned with each other in the vicinity of said intermediate proofer.

4,100,849
CONTROL SYSTEM FOR REFUSE COMPACTER

John Franklin Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,281
Int. Cl.[2] B30B *15/26*
U.S. Cl. 100—41 7 Claims



1. A process for automatically controlling the amount of restriction in apparatus for compacting refuse comprising (a) a cylindrical tube having an inlet end, a discharge end and a compaction zone therebetween, a lock-out point located near the forward end of the compaction zone, and a last smallest practicable interval of forward ram travel located downstream of the lock-out point, (b) an axially-aligned, reciprocating, driven ram in the inlet end of said tube, said ram being capable of traveling through the compaction zone, (c) a discharge port in the open discharge end of said tube, and (d) a plurality of restrictors near the discharge end of the tube for controlling the compaction pressure exerted by the refuse, said restrictors being capable of being moved inward and outward during each ram stroke in response to changes in the ram pressure required to advance the refuse through said tube, said process comprising the steps of:

(1) measuring the ram pressure during the last smallest practicable interval of forward ram travel,

(2) adjusting the restrictors inward a predetermined distance if the ram pressure measured in step (1) is less than a predetermined pressure P_1,

(3) measuring the ram pressure when the ram is at the lock-out point in its forward stroke,

(4) overriding step (2) by making no inward restrictor adjustment if the pressure measured in step (3) is less than a predetermined lock-out pressure P_3, where P_3 is the lock-out pressure and is less than P_1,

(5) measuring the ram pressures during at least the last smallest practicable interval of forward ram travel, and

(6) adjusting the restrictors outward a predetermined distance if the ram pressure measured in step (5) is greater than a predetermined pressure P_2, where P_2 is greater than P_1.

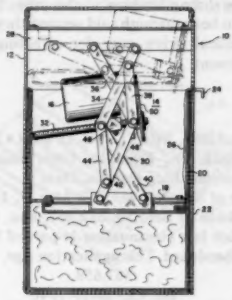
4,100,850
DRIVE MECHANISM FOR TRASH COMPACTORS

David W. Wolbrink, Hartford; William A. Kaepernick, Horicon; Du Wayne M. Sellinger, and Dieter W. Otte, both of Hartford, all of Wis., assignors to Broan Manufacturing Co., Inc., Hartford, Wis.

Filed Dec. 10, 1976, Ser. No. 749,470
Int. Cl.[2] B30B *1/18*
U.S. Cl. 100—287 24 Claims

1. A trash compactor having a ram movable in a frame into and out of a compaction position by means of a lead screw coupled to one of said ram or frame, said ram being subject to eccentric loading which alters the position of the screw, the improvement comprising;

a nut threaded on the lead screw for axial movement along the lead screw responsive to relative rotation between said screw and nut, said nut having opposing faces through which said screw extends, and a housing surrounding said nut for providing said relative rotation between said nut and screw, said housing having a pair of walls lying generally normal to the lead screw and loosely embracing said nut along said faces for permitting relative pivotal movement of said nut with respect to said housing about an axis generally normal to the lead screw, the faces of said nut having corners which abut said walls during said relative pivotal movement, said corners being beveled to facilitate said movement and to limit the movement to that neces-

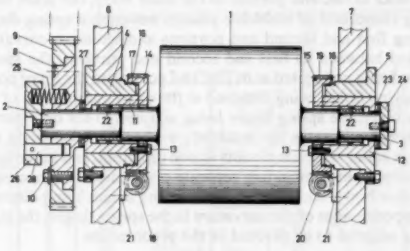


sary to accommodate a limited range of alterations in the position of the screw, said housing being coupled to the other of said ram or frame for providing movement to the ram responsive to relative rotation between the nut and screw.

4,100,851
DEVICE FOR ADJUSTING LATERAL AND CIRCUMFERENTIAL REGISTRY IN ROTARY PRINTING MACHINES

Hans-Georg Jahn, Wiesenbach, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Oct. 31, 1977, Ser. No. 846,848
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 7634679
Int. Cl.[2] B41F *13/14*
U.S. Cl. 101—248 2 Claims



1. In a rotary printing machine having a plate cylinder journalled at opposite ends thereof in a respective bearing and having a helical drive gear for the plate cylinder mounted on the journal thereof, a device for adjusting lateral register by axial shifting of the plate cylinder and for adjusting circumferential register by axial shifting of the helical drive gear, the device comprising adjusting members disposed so as to act coaxially upon at least one of the plate cylinder and the drive gear therefor, said adjusting members including a sliding bushing disposed in each bearing of the plate cylinder, a toothed rim threadedly adjustable at each of the plate-cylinder bearings and connected to the respective sliding bushing, and a respective worm spindle meshingly engaging each said toothed rim, a disc member secured to the plate-cylinder journal at one of the bearings, and first thrust bearing means engageable with said disc, the sliding bushing at the one bearing being adjustable so as to bear through said first thrust bearing means against said disc for effecting lateral register adjustment, the

helical drive gear being mounted for sliding on the journal at the other of the bearings, an entrainer disc also mounted on the journal at the other of the bearings, compression spring means for bracing the helical drive gear against said entrainer disc, and second thrust bearing means engageable with said helical drive gear, the sliding bushing at the other bearing being adjustable so as to bear through said second thrust bearing means against the helical drive gear for effecting circumferential register adjustment.

4,100,852

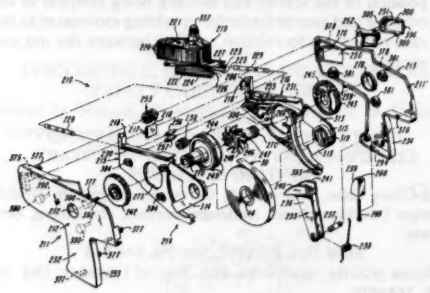
LABEL PRINTING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 449,157, Mar. 7, 1974, abandoned, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Apr. 14, 1975, Ser. No. 567,658

Int. Cl.[2] B41F *1/46*

U.S. Cl. 101—295 **35 Claims**



1. For a printing apparatus: an inker including an ink roller and a one-piece inker body, means for rotatably mounting the ink roller to one end portion of the inker body, the inker body being comprised of moldable plastics material, a spring finger having first and second end portions and having a curvature located between its first and second end portions, the spring finger being connected at its first end portion to the inker body, the spring finger being disposed at the other end portion of the inker body, the spring finger being adapted to act on a part of a printing apparatus for resiliently urging the inker body and the ink roller which it mounts in one direction, and inker body mounting means including separate pivot means connected to the inker body, said inker body mounting means being disposed on opposite sides of the curvature in the spring finger, the inker being adapted to be pivoted at the pivot means.

4,100,853

METHOD OF FORMING A POROUS SHAPED BODY CAPABLE OF RETAINING LIQUIDS THEREIN

John J. Clancy, Westwood, and Robert C. Wells, Arlington, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Aug. 9, 1976, Ser. No. 712,441

Int. Cl.[2] B29D *27/04*

U.S. Cl. 101—401.1 **30 Claims**

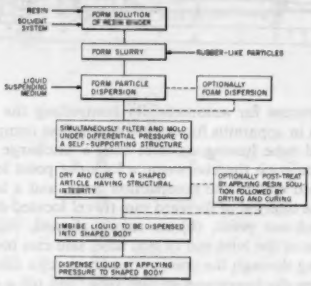
29. A method for controllably dispensing a liquid to a receptor surface, comprising:

a. forming a slurry of rubber-like particles in a solution of a heat-activatable resin binder in a solvent system containing a major amount of a first solvent for said resin binder and a minor amount of a second solvent for said resin binder, said first solvent being a non-solvent for the rubber-like particles and said second solvent being a softening agent for the rubber-like particles, said first and said second solvents for the resin binder being miscible with each other;

b. combining a liquid-suspending medium with said slurry to form a dispersion of said rubber-like particles;

c. introducing said dispersion into a mold having at least one porous wall member;

d. applying a differential pressure of from about 5 to about 100 psi across the mold to remove liquids therefrom and to form the solids into a porous shaped body which is self-supporting;


RESIN
SOLVENT SYSTEM
FORM SOLUTION OF RESIN BINDER
FORM SLURRY
RUBBER-LIKE PARTICLES
LIQUID SUSPENDING MEDIUM
FORM PARTICLE DISPERSION
OPTIONALLY FOAM DISPERSION
SIMULTANEOUSLY FILTER AND MOLD UNDER DIFFERENTIAL PRESSURE TO A SELF-SUPPORTING STRUCTURE
DRY AND CURE TO A SHAPED ARTICLE HAVING STRUCTURAL INTEGRITY
OPTIONALLY POST-TREAT BY APPLYING RESIN SOLUTION FOLLOWED BY DRYING AND CURING
IMBIBE LIQUID TO BE DISPENSED INTO SHAPED BODY
DISPENSE LIQUID BY APPLYING PRESSURE TO SHAPED BODY

e. heating said shaped body to an elevated temperature to cure the resin binder and thereby provide structural integrity to said porous shaped body;

f. contacting the porous shaped body with liquid to be controllably dispensed under conditions whereby said liquid is imbibed into pores of said porous shaped body; and,

g. bringing said porous shaped body into pressure contact with the receptor surface to controllably dispense liquid to said receptor surface.

4,100,854

DEVICE FOR MOUNTING RESIN PLATE ONTO PLATE CYLINDER

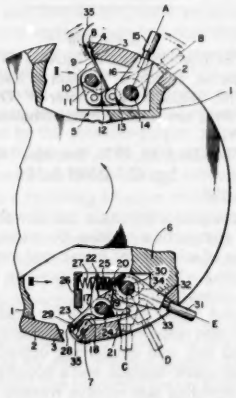
Yuji Fujishiro, and Hideo Ohta, both of Tokyo, Japan, assignors to Japan Society for Promotion of Machine Industry, Tokyo, Japan

Filed Aug. 28, 1974, Ser. No. 501,466

Claims priority, application Japan,

Int. Cl.[2] B41F *27/06*

U.S. Cl. 101—415.1 **1 Claim**



1. A device for mounting a plastic film based resin plate for use in printing on a plate cylinder, characterized in that said device comprises a first groove formed along one longitudinal

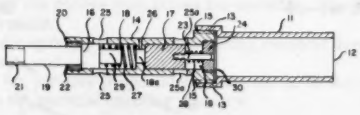
side edge of each of two members having a symmetrical semicircular section which constitute a plate cylinder, and each consisting of a plate cylinder proper and a plate cylinder outer ring, a fixing member made of a resilient material and having formed thereon a first wedge-shaped protrusion adapted to fit into the groove, with said fixing member being fixedly secured to a freely rotatable first support shaft, said first support shaft being mounted at a position adjacent to the first groove and connected through linkage composed of a first arm, a link and a second arm connected to a first operating rod, a second support shaft mounted at a position adjacent to the other longitudinal side edge of each of said two members, said second support shaft having fitted thereon and fixedly secured thereto a tension member formed with a second groove and a holding member having formed thereon a second protrusion adapted to fit into the second groove, a third support shaft adapted to be rotated by operating a second operating rod, and a cam for operating the tension member and a cam for operating the holding member fixedly secured to the third support shaft, said cams being arranged in an angular relationship so that the tension member is kept away from the holding member when the first operating rod is located at an unlocked or open position, and the first wedge-shaped protrusion of the holding member fits into the second groove of the tension member when the second operating rod is located at a locking position, and further the tension member and the holding member are rotated together away from said other longitudinal side edge while the first wedge-shaped protrusion remains fitted into the groove, when the second operating rod is rotated from the locking position to a tensioning position.

4,100,855

UNDERWATER POWER HEAD

Larry John O'Callaghan, Flat 10, 132 Sixth Ave., Inglewood, Australia

Filed Mar. 25, 1977, Ser. No. 781,215
Claims priority, application Australia, May 11, 1976, 13846/76
Int. Cl.[2] F42B *13/54*
U.S. Cl. 102—48 **5 Claims**



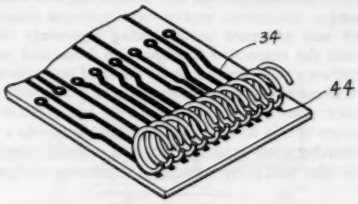
1. A power head for a fishing spear comprising a chamber to house an explosive cartridge open at one end, and a firing mechanism detachably secured to the other end of the chamber, said mechanism comprising a cylinder having two pistons slidably mounted therein and spaced apart, said first piston being connected to a piston rod projecting from the end of the cylinder remote from the chamber and said second piston being fitted with a firing pin adapted to act on a cartridge in the chamber, said cylinder being provided with a plurality of spaced ports through which water can enter and fill the space in the cylinder between the pistons, the first ports being adapted to be closed as the first piston moves along the cylinder towards the chamber and the second ports being adapted to be closed as the second piston moves in the same direction, the movement of the second piston being effected through water trapped in the cylinder between the two pistons after the first ports have been closed.

4,100,856

FUZE ENCODER

Richard Thomas Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 17, 1977, Ser. No. 769,757
Int. Cl.[2] F42C *19/06*; G06K *7/04*; H01R *9/00*
U.S. Cl. 102—206 **10 Claims**



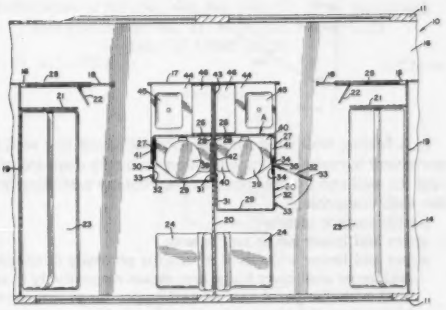
1. A method of manufacture of a contact assembly having a plurality of contact springs comprising:
providing a support having a like plurality of spaced apart conductive lands;
providing a helical spring having a like plurality of turns;
disposing each of said turns adjacent a respective one of said lands;
mechanically and electrically fixing a portion of each of said turns to the respective adjacent land; and
cutting each turn.

4,100,857

PASSAGEWAY BETWEEN ADJACENT RAILWAY PASSENGER CAR COMPARTMENTS

Jack E. Gutridge, Dyer, and Walter J. Marulic, Gary, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 11, 1977, Ser. No. 786,752
Int. Cl.[2] B61D *35/00*
U.S. Cl. 105—323 **5 Claims**



1. In a railway passenger car having a pair of compartments disposed in side by side relation and including an outer wall and a wall structure defining the inner side of the compartments and having door openings providing access from each compartment to an aisle in said car, the improvement comprising:
a telescoping divider wall separating said compartments and extending between said outer wall and said wall structure and having a portion slidable toward and away from said outer wall to respectively close off the compartments from each other and to provide a passageway between said compartments,
a sanitary closet including an enclosure in each compartment disposed at opposite sides of said divider wall intermediate the ends thereof,

each enclosure comprising a fixed section and a U-shaped extension section,

said fixed section having a first wall extending transversely from the divider wall into the respective compartment and having a second wall extending from the edge of the first wall remote from the divider wall in laterally spaced relation and generally parallel therewith,

said U-shaped extension section including inner and outer wall members and an interconnecting end wall member, and

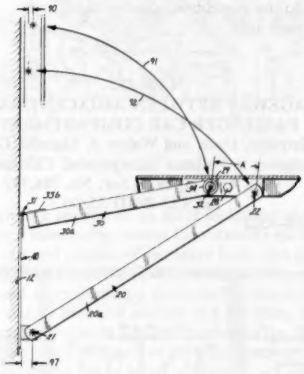
each said extension section being separately telescopable into the respective fixed section from said passageway between said compartments and said interconnecting end wall members being transversely alignable with respect to each other and with respect to the end of the divider wall when it is in its retracted position to provide a wide aisle therebetween attendant to said slidable portion of the divider wall being telescoped to provide said passageway.

4,100,858

FOLDING WALL TABLE

Richard C. Bue, Chaska, and Casey L. Carlson, Minneapolis, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Filed Jan. 21, 1977, Ser. No. 760,851
Int. Cl.[2] A47B *5/00*
U.S. Cl. 108—48 **10 Claims**



1. A folding wall table adapted for attachment to a wall for movement between a storage position vertically disposed adjacent the wall and a usable position horizontally extending from the wall, comprising:

a table surface member;

upper and lower hinge arm means;

upper and lower wall pivot means for pivotally connecting said upper and lower hinge arm means respectively to said wall with the pivot axis of said upper hinge arm means higher than the pivot axis of said lower hinge arm means;

upper and lower table pivot means for pivotally connecting said upper and lower hinge arm means respectively to the underside of said table surface member with the pivot axis of said upper table pivot means positioned closer to the wall, when the table is in its usable position, than the pivot axis of said lower table pivot means;

said hinge arm means and said pivot means for allowing movement of said table surface member between its usable and its storage position with the underside of the table folding against the wall in the storage position; and

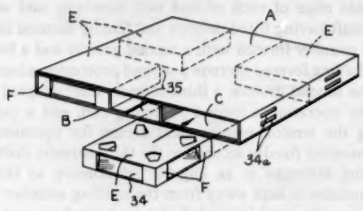
the pivot axis of said lower table pivot means being spaced below a plane passing through the pivot axis of said upper table pivot means and parallel with the table surface when in its usable position, so that the pivot axis of said lower table pivot passes through a plane containing the upper hinge arm and its pivot axes to provide an overcenter resistance force as the table moves through an intermediate position near the storage position.

4,100,859

FORK LIFT PALLET

Alexander B. Clark, Jr., Box 2012, Hendersonville, N.C. 28739

Filed Sep. 7, 1976, Ser. No. 720,963
Int. Cl.[2] B65D *19/34*
U.S. Cl. 108—51.3 **6 Claims**



5. A support member for a fork lift pallet comprising:

a substantially rectangular cardboard blank;

opposed end walls defined by spaced pairs of transverse scores in said blank;

each of said end walls being spaced inwardly of opposed edges of said blank defining top flaps when said blank is folded along said scores;

opposed side walls defined by a plurality of longitudinal scores adjacent each edge of said blank;

a pair of inwardly foldable vertical flaps hinged at opposed ends thereof adjacent spaced intermediate portions of at least one of said walls; and

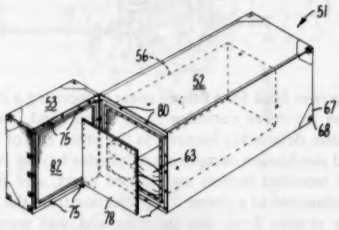
said flaps when folded inwardly forming a triangular tubular core at each corner of said support member and fork lift openings therebetween.

4,100,860

SAFE TRANSPORATION OF HAZARDOUS MATERIALS

Kenneth A. Gablin, Burton, and Larry J. Hansen, Tacoma, both of Wash., assignors to Nuclear Engineering Co., Inc., Louisville, Ky.

Continuation of Ser. No. 171,713, Aug. 13, 1971, abandoned.
This application Nov. 26, 1973, Ser. No. 418,928
Int. Cl.[2] E04B *2/02*; B65D *25/18*
U.S. Cl. 109—83 **28 Claims**



1. In a shipping container overpack for protected transportation of hazardous materials and the like,

a receptacle formed in a plurality of sections,

a resilient gasket positionable in sealing engagement between said sections for releasably sealing them together to provide a leakproof overpack,

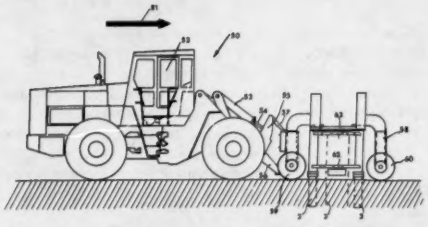
attachment means for operatively engaging and releasably securing said sections together with said gasket positioned in sealing engagement therebetween,

at least one of said sections being defined by wall structures, comprising
an inner liner,
an outer shell spaced from said inner liner,
reinforcing plates positioned at the inner surfaces of said outer shell for resisting penetration of said outer shell by external objects and
a layer of foam material sandwiched between and adhered to said inner liner and said outer shell and
wall means joining said inner liner and outer shell to enclose said layer of foam material.

4,100,861
SOIL STABILIZING APPARATUS

Gunnar Olsson, (Matrosvagen 7), Svortkarrsvagen 24, S-133 00 Saltjobaden, Sweden

Division of Ser. No. 735,363, Oct. 26, 1976, Pat. No. 4,063,523.
This application Sep. 6, 1977, Ser. No. 830,976
Int. Cl.[2] A01C *23/02*
U.S. Cl. 111—7 **9 Claims**



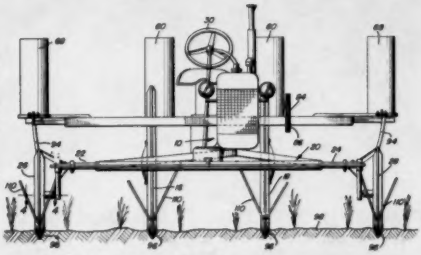
1. An apparatus for mixing into a ground layer a ground stabilizing material in solid or liquid form, said apparatus comprising:
a carrier,
means for moving said carrier in an endless path above the ground surface,
said carrier including a number of material injecting members,
a storage container carrying ground stabilizing material,
means for transferring said material from said storage container to said material injecting members, the improvement wherein:
said means for moving said carrier in an endless path above the ground surface comprises means for moving said material injecting members in a substantially linear portion of the endless path across the travelling direction of the vehicle,
means for agitating the material injecting members during its passage, and
means for variably proportioning material at its departure from the material injecting members.

4,100,862
4-ROW TRAC PLANTER

Robert P. Mowen, and Jacob D. Gettings, both of R.R. #4, Jerseyville, Ill. 62052

Filed Mar. 21, 1977, Ser. No. 779,737
Int. Cl.[2] A01C *5/00*
U.S. Cl. 111—52 **3 Claims**

1. A trac planter comprising a frame including journalled narrow front and rear pairs of opposite side wheels, a prime mover mounted on said frame and drivingly connected to at least one pair of said wheels, said frame defining a longitudinal center line, said wheels being disposed in four vertical planes paralleling said center line and spaced equally apart transversely of said frame, said wheels including narrow outer peripheral portions adapted, due to the gross weight of said planter, to form narrow depressed tracks in cultivated ground over which said planter travels, and seed planting means supported from said frame and including narrow depending seed discharging means disposed immediately rearwardly of each of said wheels, in the corresponding vertical plane, and operative to discharge seeds into the depressed ground tracks formed by said wheels, the outer peripheral portions of said wheels being generally V-shaped in cross-sectional shape with their apex portions facing generally radially outwardly of the corresponding axes of rotation of said wheels, each of said wheels having a rearwardly and upwardly opening and inclined generally V-shaped standing crop divider operatively supported

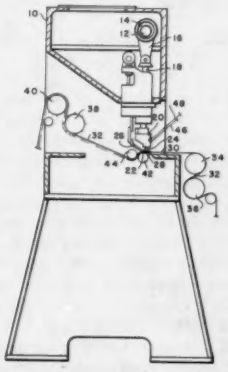


from said frame immediately ahead of the lower forward quadrant of the corresponding wheel, said frame, other than said depending seed discharging means and said standing crop dividers being devoid of portions thereof projecting more than slightly below the axes of rotation of said wheels, the lower portions of said wheels, below elevations thereon spaced only slightly below said axes of rotation thereof, being of axial thicknesses no greater than the width of said outer peripheral portions, said wheels being supported from said frame with their axes of rotation spaced below said frame.

4,100,863
TUFTING MACHINE

Willard Harmond Shortte, Jr., La Grange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 662,262, Feb. 27, 1976, abandoned.
This application Jul. 11, 1977, Ser. No. 814,222
Int. Cl.[2] D05C *15/28*
U.S. Cl. 112—79 R **1 Claim**



1. Apparatus to produce a tufted pile fabric comprising: a frame, a needle bar mounted in said frame, a first means to reciprocate said needle bar, at least two rows of hollow tufting needles mounted on said needle bar, a needle plate, means to supply a backing material to said rows of hollow tufting needles over said needle plate, means to supply yarn to each of said hollow needles to project the loops of yarn beyond the tip

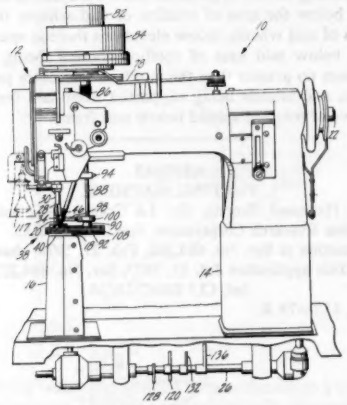
of the needle through said needle plate and the backing material by the action of fluid streams moving through the needles, nip roll means mounted closely adjacent said hollow tufting needles with the centerline of each below said needle plate and on the side of said needles away from the means to supply backing material to guide tufted fabric away from said needles and means to periodically move said roll means laterally of said tufting needles to shift the lateral position of said backing material to lessen the rowing effect in the tufted fabric.

4,100,864

AUTOMATIC WORK GUIDANCE MECHANISM

Edward Spencer Babson, Ipswich; Donald Franklin Herdeg, South Hamilton, and William Burrows Mercaldi, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jan. 17, 1977, Ser. No. 760,138
Int. Cl.[2] D05B *19/00, 27/14*
U.S. Cl. 112—121.11 **16 Claims**



1. A machine comprising a tool movable toward and from a workpiece to be progressively processed, means for slidably supporting the workpiece adjacent to the operating locality of the tool, and a compound feeding-steering means movably mounted on and engageable solely with the opposite side of the workpiece from said workpiece supporting means for progressively orienting the workpiece by exerting torque while feeding it thereon, said feeding-steering means being responsive to predetermined pattern means which is movable synchronously with the work to automatically determine the operating path of the tool on the work.

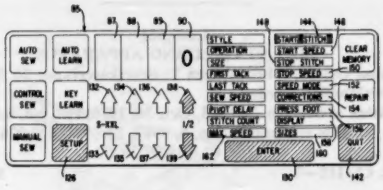
5. A sewing machine having a head and a work supporting surface spaced therefrom, stitching means carried by the head and including a needle reciprocable relative to a portion of the work supporting surface, and a unitary feeding-steering element movably mounted on the opposite side of the work from said portion of the work supporting surface for guiding a workpiece thereon, said feeding-steering element being responsive to a predetermined pattern control means thus to apply a turning moment to the work and about the axis of the needle incrementally to guide the work automatically during each increment the work is fed.

4,100,865

PROGRAMMABLE SEWING MACHINE OPERABLE IN A PLURALITY OF MODES

John Vernon Landau, Jr.; Barney Dean Hunts, both of Mountain Lakes; Frederick Alexander Rupinski, Lyndhurst, and Alfred John Zenger, Montville, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,889
Int. Cl.[2] D05B *19/00*
U.S. Cl. 112—121.11 **11 Claims**



1. A programmable sewing system comprising:

a sewing machine having a plurality of components operable selectively manually and automatically;

a programmable computer having memory means and a plurality of input terminals coupled to said sewing machine for receiving signals indicative of operation of said components of said sewing machine, and a plurality of output terminals coupled to said sewing machine for actuating operation of said components of said sewing machine;

a manually actuated control panel coupled to said computer for entering sewing instructions, said control panel including display means coupled to said computer for receiving display information therefrom;

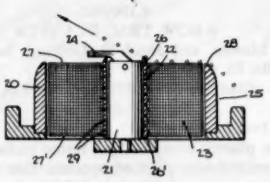
said system having a first mode of operation selected by way of said control panel wherein basic sewing system operating conditions may be introduced to said computer memory means for subsequent control of said system, said conditions including maximum speed of sewing machine operation, number of start stitches initiating a sequence of stitching operations and speed at which accomplished, and number of stop stitches terminating each segment of said sequence of stitching operations, and speed at which accomplished.

4,100,866

CORE CONSTRUCTION FOR A SEWING MACHINE BOBBIN

Michael R. Philips, Pomona, N.Y., assignor to Jonathan Temple Incorporated, Hackensack, N.J.

Filed Mar. 31, 1977, Ser. No. 783,406
Int. Cl.[2] D05B *57/28*
U.S. Cl. 112—231 **5 Claims**



1. In a sewing machine bobbin adapted for disposal in a bobbin case, said bobbin including a hollow cylindrical core on which a thread mass is wound adapted for slidable disposal over a center post mounted in said bobbin case, said bobbin case including latch means mounted on said post for securing said cylindrical core and said thread mass in said bobbin case,

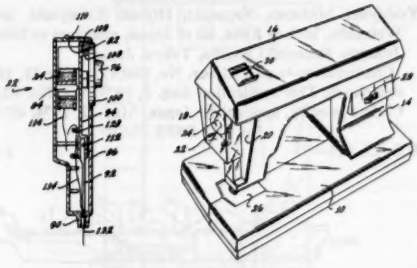
and said post and said latch means having a combined axial length greater than the axial width of said bobbin case, the improvement comprising said hollow cylindrical core having the edge of at least one end thereof axially tapered radially inwardly along the axis of said core away from said end towards said center post, said thread mass being wound on said core so that said tapered edge extends axially outwardly along said core axis beyond the surface of said thread mass, said edge having an axial length which is greater than the axial distance between said bobbin case and said latch means, said edge cooperating with said latch means to limit movement of said core on said post so that said surface of said thread mass does not extend axially beyond said bobbin case.

4,100,867

SEWING MACHINE

Sidney Bass, Los Angeles, and Hubert Allen Rich, Westminster, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 21, 1977, Ser. No. 761,381
Int. Cl.[2] D05B *55/00, 69/22*
U.S. Cl. 112—270 **12 Claims**



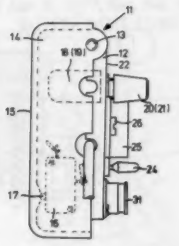
1. In a sewing machine, the combination comprising:
a housing having a bed and an overhanging bracket arm terminating in a head, said head having a recessed surface in a side thereof with said surface generally perpendicular to said bed;
a driving member rotatably mounted in said housing and having a portion thereof extending outwardly through an aperture in said recessed surface;
means within said housing for rotating said driving member;
a cartridge engaging said head within said recessed surface, said cartridge having a planar surface with an aperture therein in communication with said portion of said driving member;
a needle carrier slidably mounted on said planar surface within said cartridge for actuation by said driving member for reciprocating movement toward and away from said bed;
a needle secured to said needle carrier, said cartridge having an opening in alignment with said needle and in proximity to said bed for passage therethrough of said needle, said needle being substantially contained within said cartridge with said needle carrier at its maximum distance away from said bed; and
looping means within said bed for coacting with said needle whereby to generate a stitch in material sewn on said sewing machine.

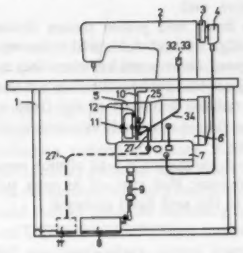
4,100,868

APPARATUS FOR LIMITING MAXIMUM NUMBER OF STITCHES OF SEWING-MACHINES

Harry Reinecke, Walldorf, and Gerhard Bachmann, Eppelheim, both of Germany, assignors to Frankl & Kirchner GmbH. & Co. KG. Fabrik fur Elektromotoren und elektrische Apparate, Schwetzingen, Germany

Filed Dec. 9, 1976, Ser. No. 749,094
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 7539310[U]
Int. Cl.[2] D05B *69/18*
U.S. Cl. 112—277 **8 Claims**





1. In an apparatus for limiting the maximum number of stiches of sewing machines having a motor, a clutch and brake part associated with the motor, control means for the clutch and brake, and regulating circuit means including a first and a second potentiometer and switch means in circuit to limit the maximum rotational speed of the drive, the improvement wherein said switch means includes a contact switch, a position switch and an independent knee switch having a first surface and a second surface, said first surface being swivelable about an axis; an actuating member connected to said contact switch, said actuating member being in contact with said first surface and said position switch being mounted on said second surface; and adjusting members coupled to respective ones of said two potentiometers for allowing adjustment thereof, said adjusting members being positioned on a surface of said knee switch.

4,100,869

EXPANDING CRIMP TOOL FOR VALVED DISPENSERS AND THE LIKE

Jerome A. Gross, 6304 S. Rosebury, St. Louis, Mo. 63105

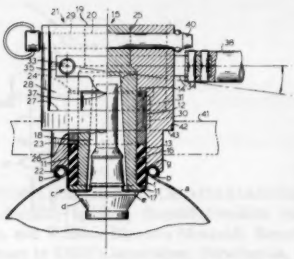
Filed Jan. 26, 1977, Ser. No. 762,497
Int. Cl.[2] B21D *37/00*
U.S. Cl. 113—18 R **5 Claims**

1. For crimping into the mouth of a dispensing can a valve mounting cup of the type having a convex rim and an inner wall extending downward therefrom to a valve-mounting surface, a crimping tool, comprising
an outer member having a vertical axis and having a lower surface portion adapted to fit onto such convex rim and having a cylindrical inner restraining surface,

an inner member secured thereto in fixed position and having an outer cylindrical restraining surface spaced radially inward from said inner surface of the outer member and extending axially downward a fixed distance beyond its said lower surface portion and terminating in a radially outward base flange,

a rubber-like sleeve positioned on said flange and extending upward therefrom beyond said lower surface portion of said outer member into the said space between the said spaced restraining surfaces,

annular piston means fitted between said restraining surfaces



in said space and having a lower edge upon said rubber-like sleeve, and

means to force said piston means downward against the upper edge of said rubber-like sleeve, whereby, as it is compressed downward between said cylindrical restraining surfaces said rubber-like sleeve is shortened axially and bulges radially outward in the fixed space between the said base flange and the lower surface portion of the outer member,

thereby to draw the inner wall of such mounting cup radially outward over that part of its area whose depth corresponds to the said fixed distance.

4,100,870

SURFBOARD

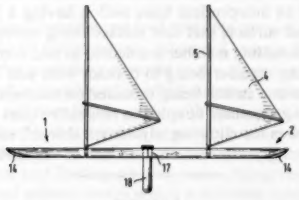
Ernstfried Prade, Nijmegen, Netherlands, assignor to Mistral Windsurfing AG, Zurich, Switzerland

Filed Apr. 1, 1977, Ser. No. 783,845

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 7610087[U]; Mar. 10, 1977, 7707436[U]

Int. Cl.² B63H 9/04

U.S. Cl. 114—39 **18 Claims**



1. A sailboard having an unstayed rig, said sailboard comprising: a surfboard having a keel box and a retractable keel; a mast; a universal joint mounting said mast on said surfboard; a sail having a neck and a lower bolt-rope; spars having nocks and fixed to the mast for the retention and adjustment of said mast and sail, said sail being attached between said mast and the nocks of said spars, the lower bolt-rope of said sail extending from the nocks of said spars to said mast at a downward inclination, said spars being fixed to said mast above the neck of said sail; wherein said surfboard is provided with a coupling portion for coupling said surfboard to a similar surfboard by a flexible coupling means to form a composite surfer, said coupling means allowing relative movement of said coupled surfboards, said coupling portions being disposed at the stern of each said surfboard for coupling said surfboards stern to stern, to form a tandem surfer.

4,100,871

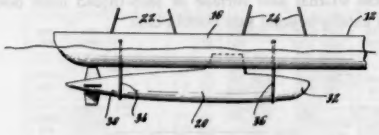
RESCUE APPARATUS FOR SUBMERGED VESSELS

Arnold Forde, 1801 N. Ventura Rd. #65, Oxnard, Calif. 93030

Filed Apr. 7, 1977, Ser. No. 785,428

Int. Cl.² B63C 7/00

U.S. Cl. 114—51 **4 Claims**



1. Apparatus for positioning a submerged vessel near the surface of a water body which comprises a ship having two integral hull sections extending generally parallel to each other to define an area between said hulls, derrick means including winch and cable means attached to said hulls for lifting said submerged vessel into said area, and at least two U-shaped vessel support bars each extending across said area and pivotally mounted at opposiing ends to each hull for rotation in a direction transverse to the longitudinal axis of said hulls.

4,100,872

SLURRY VESSEL

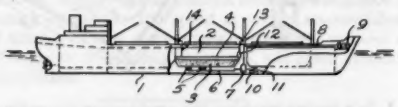
Yoshiyuki Matsuno, Nagasaki; Hiroshi Kobayashi, and Ryo Watanabe, both of Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 580,472, May 22, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,360

Claims priority, application Japan, May 22, 1974, 49/57483

Int. Cl.² B63B 25/04

U.S. Cl. 114—73 **2 Claims**



1. A slurry vessel, including:

at least one arrangement of side walls and bottom wall together constituting wall means defining a hold for containing a layer of slurry comprising grains suspended in a liquid, which slurry is to be transported during a cruise of the vessel, during which cruise, the grains will be gradually precipitating, gradually producing an upper layer of supernatant liquid, and a lower layer of increased solids content slurry precipitant that is tending to increase in bulk density through consolidation, a gradually lowering interfacial surface forms and becomes better defined between said upper layer of liquid and said lower layer of slurry;

vacuum dewatering means comprising:

dewatering port means communicating with the hold through the wall means;

a vacuum tank connected to the dewatering port means and having a level up to which it is anticipated the vacuum tank may become filled with liquid;

a vacuum pump connected to the vacuum tank above said anticipated liquid level therein;

a drain pump connected to the vacuum tank for communication with the liquid drawn into the tank by the vacuum pump; and

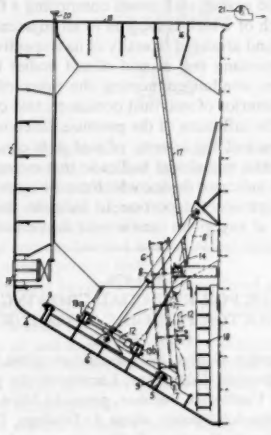
a drain line connected to the drain pump, for removing accumulating liquid from the vacuum tank;

means for detecting the level of the interfacial surface between the slurry contained in the hold and the supernatant liquid from which the slurry is precipitating, as a way of monitoring the degree of consolidation of the slurry, whereby the vacuum dewatering means may be operated when the degree of consolidation exceeds a predetermined value, to ensure that when the vessel reaches its destination, the slurry will not have consolidated to so great a degree as to hamper unloading, this level detecting means being constituted by a flat, essentially horizontally disposed plate having a plurality of generally vertical perforations which are adapted to allow free flow of supernatant liquid therethrough and means for suspending said plate, said plate being made of a material with specific gravity that is larger than that of the supernatant liquid of said slurry, but smaller than that of said slurry so that when lowered, via said suspending means, said plate will sink through any overlying supernatant liquid of said slurry and come to rest upon said slurry.

4,100,873
FLOATING CRAFT

Willem Paul Kaldenbach, Delft, Netherlands, assignor to Netherlands Offshore Company (Nederlandse Maatschappij voor Werken Buitengaats) B.V., Delft, Netherlands

Filed Nov. 1, 1976, Ser. No. 737,581
Claims priority, application United Kingdom, Nov. 14, 1975, 47133/75
Int. Cl.² B63B *43/06*
U.S. Cl. 114—125 **1 Claim**

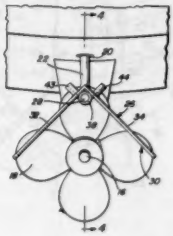


1. A floating vessel equipped with at least one crane for lifting heavy loads and comprising a plurality of tank means each having wall means defining at least part of the outer surface of the vessel which is in contact with the sea, each said tank means being located at least in part below the water-line of the vessel, means defining a plurality of large openings in said wall means of each of said tank means, each of said openings serving to connect the interior of its associated tank means with the sea and being so disposed below the said water-line and of such large size relative to the sizes of the tank means as to permit the sea water to flow substantially freely into and out of the associated tank means in accordance with the motion of the sea, closure means for each said opening, means mounting each said closure means for movement relative to its associated opening between a closed position in which the closure means closes its associated opening in a substantially water-tight manner and an open position, means for actuating each said closure means between its said closed and open positions and vice versa, whereby to change at least one of the roll and pitch periods of the vessel and wherein each closure means comprises a door pivotally mounted for movement within its associated tank means, between its closed position in sealing relation with the means defining its associated opening and its open position, said actuating means comprises hydraulic cylinder means for moving said door between said positions, and hydraulically actuated locking means on said door operable to lock the door in both its closed and open position.

4,100,874
FLAP RUDDER

Delatte U. Wright, Star Rte. 1, Box 569F, Rockport, Tex. 78382

Filed Apr. 8, 1977, Ser. No. 786,481
Int. Cl.² B63H *25/06*
U.S. Cl. 114—162 **9 Claims**

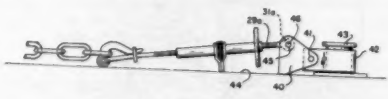


1. In combination with a boat hull including a generally horizontal propeller shaft having a marine propeller mounted thereon, a rudder assembly oscillatably supported from said hull in horizontal registry with and behind said propeller and for angular displacement about an upstanding axis, said rudder assembly including mounting means defining a horizontal pivot axis and a rudder member supported from said mounting means for free oscillation, between limits, about said horizontal pivot axis, said rudder member including a pair of relatively angulated and adjacent rudder panels including adjacent generaly parallel marginal edges joined together, said rudder panels, upon oscillation of said rudder member relative to said mounting means about said horizontal axis, oscillating in unison in the same directions relative to said mounting means, said marginal edges generally paralleling said horizontal pivot axis and the included angle defined by said rudder panels opening downwardly.

4,100,875
CONNECTORS

William W. Patterson, III, and Eugene F. Grapes, both of c/o W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

Filed Mar. 28, 1977, Ser. No. 782,049
Int. Cl.² B63B *21/00*
U.S. Cl. 114—251 **6 Claims**



1. Connector means for barges and the like comprising a threaded ratchet tube, a central ratchet drive for rotating said tube, an annular drive wheel surrounding and connected to said tube for rotating the same, separate right and left hand threaded screw members having one end threaded into said tube, fastening means on the other end of each said screw members and removable anchor means adapted to engage a surface over which the ratchet tube extends and pivotally secured to one of said fastening means on said separate screw members on the end remote from said tube and holding said

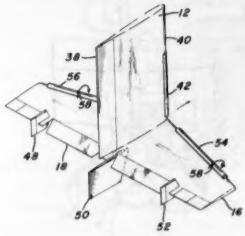
tube and fastening means at an angle above said surface so as to have said tubes a distance greater than the radius of said annular drive wheel whereby the drive wheel is always free of the surface to facilitate turning by hand.

4,100,876

HYDROFOIL FIXED STRUT STEERING CONTROL

Christiaan C. Feleus, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 18, 1977, Ser. No. 797,984
Int. Cl.[2] B63B *1/18*
U.S. Cl. 114—274 **3 Claims**



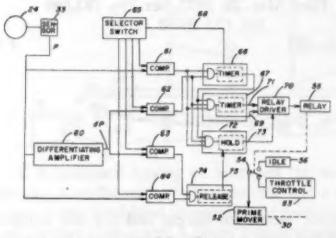
1. A steering control for hydrofoil craft comprising a non-rotatable vertical strut element secured to the bottom portion of the craft, a submergible foil element carried at the bottom of said strut, a trailing edge rotatable rudder operatively associated with at least one of said elements, at least one rotatable roller mounted at the leading edge of said strut, said roller being exposed to liquid impinging on the leading edge of the strut as the hydrofoil craft traverses the surface of a body of water, said roller being stationary when the hydrofoil craft is not turning whereby the forces on opposite sides of the strut will be substantially the same, and means for rotating said roller in coordination with said rudder during a turn of the hydrofoil craft to thereby reduce side forces on the strut which are opposing the turn.

4,100,877

PROTECTIVE CONTROL SYSTEM FOR WATER-JET PROPULSION SYSTEMS

John H. Scott, Issaquah, and Walter R. Weist, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1976, Ser. No. 727,023
Int. Cl.[2] B63H *11/08*
U.S. Cl. 115—11 **7 Claims**



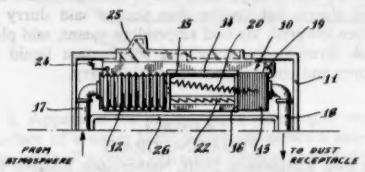
1. In a propulsion system for watercraft having an inlet for water, pump means for discharging said water in a jet to provide a propulsive force and a prime mover for driving the pump means, a control system for said prime mover including means for generating a pressure signal proportional to the water pressure in said inlet and a rate signal proportional to the rate of change of said water pressure, and means for setting said prime mover to idling speed when both of said signals fall below first predetermined reference levels and remain below said levels for a predetermined time.

4,100,878

VACUUM CLEANER DUST CONTAINER FILLING INDICATOR DEVICE

Karl Eric Leinfelt, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Dec. 2, 1976, Ser. No. 746,813
Claims priority, application Sweden, Dec. 5, 1975, 7513734
Int. Cl.[2] A47L *9/00*; G01D *21/00*
U.S. Cl. 116—114 AD **8 Claims**



1. An indicator device for a vacuum cleaner visible from the outside thereof and showing the amount of filling of a vacuum cleaner dust container comprising: a casing for said indicator device having a transparent portion, a pair of resilient spaced closed bodies in said casing, a frame for said closed bodies in said casing, means interconnecting said closed bodies and mounted in said casing, said means comprising a frame having end pieces each of which is secured to an adjacent one of said closed bodies and arranged laterally of its respective end piece, a conduit connecting one of said closed bodies to the atmosphere, another conduit connecting the other of said closed bodies to the interior of said dust container, said closed bodies acting under the influence of the pressure differential between the atmosphere and the interior of said dust container to expand and contrast said closed bodies so that movement occurs linearly in said indicator device which can be visually observed through said transparent portion to indicate the amount of filling present at any given time in said dust container.

4,100,879

DEVICE FOR EPITAXIAL GROWING OF SEMICONDUCTOR PERIODIC STRUCTURES FROM GAS PHASE

Grigory Borisovich Goldin, Pervomaiskaya ulitsa, 66, kv. 147; Valentin Petrovich Khlebnikov, Lomonosovsky prospekt, 34, kv. 93; Jury Vasilievich Jushkov, prospekt Mira, 188, kv. 60; Vadim Nikolaevich Maslov, ulitsa A. Tolstogo, 22/2, kv. 101; Oleg Evgenievich Korobov, Golikovsky pereulok, 13, kv. 6; Vladimir Petrovich Kuklev, Frunzensky val, 38, kv. 47, all of Moscow; Vladimir Grigorievich Demyanets, prospekt Mira, 9, kv. 57, Fryazino Moskovskoi oblasti; Ljudvig Alexandrovich Dolomanov, ulitsa Uritskogo, 12[a], kv. 10, Ljubertsy Moskovskoi oblasti; Emilia Stanislavovna Kudeyarova, Leningradskaya ulitsa, 4"b", kv. 29, Podolsk Moskovskoi oblasti; Vladimir Viktorovich Nechaev, Avtozavodskaya ulitsa 9/1, kv. 24, Moscow; Ellin Petrovich Bochkarev, Leninsky prospekt, 71/11, kv. 385, Moscow; Nikolai Georgievich Voronin, ulitsa Petrozavodskaya, 15, korpus 2, kv. 164, Moscow, and Jury Anatolievich Drozdov, ulitsa Krasny Kazanets, 1, korpus 2, kv. 92, Moscow, all of U.S.S.R.

Filed Feb. 8, 1977, Ser. No. 766,775
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49.1 **16 Claims**

1. A device for epitaxial growing of semiconductor periodic structures from a gas phase, comprising:

a vertical tubular reaction vessel filled with gas and having an inlet and an outlet for said gas containing an agent for carrying out the chemical reaction;

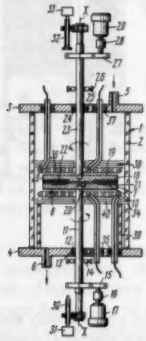
a first disk located in said vessel and having an external surface and an operational surface, at least one substrate being placed near its periphery;

a first electric motor for rotating said first disk about the vertical axis of said vessel, which is located outside vessel and mechanically connected to said first disk;

at least two sources of substances forming the layers of said semiconductor periodic structure being grown;

a second disk located in said vessel near said first disk and coaxial thereto, said second disk having a diameter equal to the diameter of said first disk, said second disk having an external surface and an operational surface parallel to said operational surface of said first disk and holding at least two said substance sources adjoining each other and alternating in the direction of rotation of said second disk about said vertical axis of said vessel;

a second electric motor for rotating said second disk about said vertical axis of said vessel, which is located outside said vessel and mechanically connected to said second disk;



a drive for shifting a disk along said vertical axis of said vessel and located outside the vessel and mechanically connected to one of said disks;

a heater of a substrate located in said vessel near said external surface of said first disk;

a heater of sources located in said vessel near said external surface of said second disk;

both said heaters having a flat heating front and ensuring a temperature field with flat isothermal surfaces parallel to said operational surfaces of said disks;

at least one of said sources being a first semiconductor material with composition corresponding to the composition of the first group of layers of said periodic semiconductor structure being grown;

at least the second of said sources being made of a second semiconductor material with composition corresponding to the composition of the layers of said structure;

said disks being located with a clearance between the surfaces of said substrate and a respective source, selected from an interval from 50 microns to 5 mm.

4,100,880

APPARATUS FOR THE TREATMENT OF THREAD AND THE LIKE

Erhard T. May, c/o Kellenberg Strasse, D-8960 Kempten, Fed. Rep. of Germany

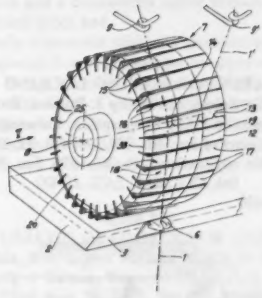
Filed Apr. 21, 1977, Ser. No. 789,418

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636058

Int. Cl.[2] B05C *1/08*

U.S. Cl. 118—234 **9 Claims**

1. In apparatus for the treatment of thread and the like with a treatment fluid such as liquid wax, oil and the like, during the winding process of the thread on a cross-wound bobbin and the like mounted on a pirn tube rotating at constant speed, said apparatus including a treatment roller driven at a constant rotational speed, one part of the peripheral area thereof dipping into a bath containing the treatment fluid, said treatment roller having on its peripheral area axially extending grooves, two thread guides, the first one of said guides being stationary and the second one of said guides being movable substantially parallel to the axle of the treatment roller, and which are installed in such manner that the thread which is stretched therebetween lies against the peripheral area of the treatment roller over a certain length, the improvement which comprises



said treatment roller having a cylindrical first circumference segment area adjacent one end of the roller and a second circumference segment area adjacent thereto and having radially disposed and axially extending small webs, the free edges of which enter into the circumference surface of said second cylindrical circumference segment area and which form therebetween said axial grooves, said grooves having a depth which begins at zero on the inner borderline of said first cylindrical circumference segment area and which toward the other end of said treatment roller increase overproportionally to the groove length.

4,100,881

APPARATUS FOR APPLYING A COVERING ON HEAT-SENSITIVE ARTICLES BY MEANS OF A BLOWPIPE

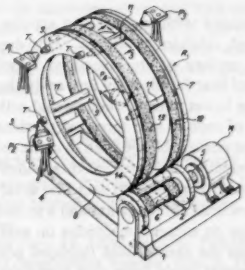
Félix d'Andréa, Asnieres, and Louis Minjolle, Tarbes, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 24, 1972, Ser. No. 229,224

Claims priority, application France, Feb. 24, 1972, 71.06249

Int. Cl.[2] B05B *13/02;* **B05C** *5/00*

U.S. Cl. 118—319 **4 Claims**



1. An apparatus for producing a covering comprising at least one stationary blowpipe for spraying or blasting, a continuous moving support member bearing the article for treatment, drive means for said support adapted to present the article to the blowpipe at intervals, the exposure time of the same zone of the article to spraying or blasting being very short relative to

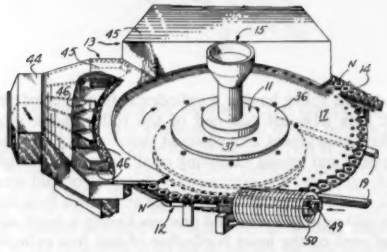
the time between two consecutive exposures, said support being a wheel, two lateral rims for said wheel, article support members rotatably mounted between said rims and means for engaging the articles on said support members as to move solidly therewith in all movements of said support members.

4,100,882

APPARATUS FOR MAKING LOCKING NUTS

Richard J. Duffy, Salem, and Philip J. Rodden, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 704,294, Jul. 12, 1976, Pat. No. 4,054,688. This application Oct. 20, 1976, Ser. No. 734,383
Int. Cl.[2] B05C 7/02, 19/00
U.S. Cl. 118—620 9 Claims



1. Apparatus for applying locking patches of resilient resin to a succession of internally threaded articles having openings at both ends of the threaded portions comprising:

a feeder to supply said threaded articles in substantially continuous succession;

a support for receiving said threaded articles from said feeder for conveying them in a first substantially fixed relation with respect to said support for a first portion of a path for treatment of successive articles with the axes of their threaded portions in an up and down position and with the openings at the upper and lower ends of the threaded portions substantially uncovered;

means for heating said threaded portions of said articles to a temperature above the softening point of resin to be applied;

means associated with each of said articles and in substantially fixed relation to a first resin deposition area of threaded surface of its associated article for directing particles of heat fusible resin upwardly through said openings at the lower ends of each of said articles against said first area of each of said threaded portions of said articles in said first portion of said path to cause said resin particles to be softened by heat from said threaded portions and to build up a deposit on each said first area; and

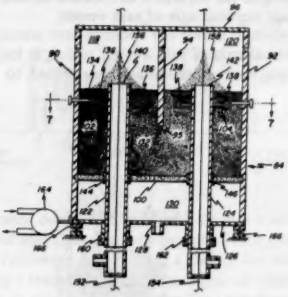
means between said first portion and a second portion of said path acting on successive articles on said support to turn them about the axes of said threaded portions through a predetermined angle from said first relation to a second substantially fixed relation with respect to its associated directing means and said support for said second portion of said path to position a further area of each of said threaded portions, angularly spaced from each said first area, to receive resin particles from said directing means and to build up a deposit on said further area of each of said articles in said second portion of said path.

4,100,883

APPARATUS FOR ELECTROSTATIC DEPOSITION ON A RUNNING CONDUCTOR

John H. Lupinski, Scotia, and Bernard Gorowitz, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,236
Int. Cl.[2] B05B 5/00
U.S. Cl. 118—630 6 Claims



1. An apparatus for continuously and simultaneously coating a plurality of elongate electrical conductors, comprising:

(A) a container having a lower portion for containing a fluidized bed of electrically chargeable powder and an upper portion adjoining the lower portion for deposition of electrically charged powder onto the conductors,

(B) a plurality of spaced apart hollow members disposed in the lower portion of the container, each of said hollow members providing a passageway from the exterior of the container to the interior of the container and having an upwardly extending portion terminating in an open upper end defining an interface between the upper and lower portions of the container,

(C) means for advancing each elongate electrical conductor along a path respectively through a different one of said hollow members, upwardly out of the upwardly extending portion thereof, and through the top of the upper container portion,

(D) a porous member adapted to pass a gaseous medium upwardly therethrough so that the medium fluidizes the powder to provide said fluidized bed, said porous member disposed at a lower end of the lower portion of the container,

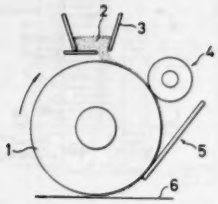
(E) barrier means dividing said upper portion of the container into a plurality of compartments equal in number to the number of said hollow members, each of said compartments being disposed above only one of said hollow member open upper ends, said barrier means having a lower end spaced above said porous member and disposed lower than each hollow member upper end, and

(F) electrode means operably associated with the container and operable at an electrical potential different from the electrical potential of the conductors, whereby charged particles are transferred from the fluidized bed to each conductor in the region of the upper portion of the container adjacently above the open upper end of the hollow member through which such conductor is advanced.

4,100,884
RUBBER DEVELOPER ROLLER USING SINGLE COMPONENT TONER

Nobuo Mochizuki, Matsudo, and Hiromi Demizu, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 15, 1977, Ser. No. 768,828
Claims priority, application Japan, Feb. 25, 1976, 51-19542; Apr. 13, 1976, 51-41469; May 26, 1976, 51-60831
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—653 19 Claims



1. An apparatus for developing an electrostatic image on an electrostatic image bearing member, comprising:

a rotatable developing roller disposed adjacent said electrostatic image bearing member, at least the surface of the roller being formed of an elastic rubber and containing an additive which improves its release capability with respect to a toner;

supply means for uniformly supplying to the surface of the developing roller one-component developer having a volumetric resistivity of not less than 10^6 Ω cm;

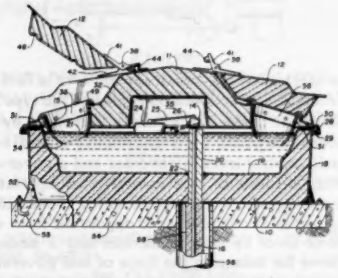
charging means disposed forwardly of the location of the supply means as viewed in the direction of rotation of the developing roller for charging the developer on the developing roller to the opposite polarity from the polarity of the electric charge which forms an electrostatic image on said image bearing member; and

means for rotating the developing roller in a manner such that the ratio of the peripheral speed of the developing roller to the speed of movement of the image bearing member is equal to or greater than 1.0.

4,100,885
STOCK WATERER

Lawrence E. Kapplinger, Spring Lake Park, Minn., assignor to Advanced Engineering & Manufacturing Company, Inc., Minneapolis, Minn.

Filed Dec. 6, 1976, Ser. No. 748,059
Int. Cl.[2] A01K *7/02*
U.S. Cl. 119—73 11 Claims



1. A stock watering device comprising:

an insulated tank for receiving a quantity of water, said insulated tank having an insulated cover portion;

means for maintaining the water within said insulated tank at a predetermined level;

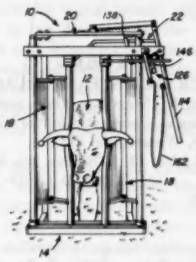
at least one drinking well provided in said insulated cover portion for providing limited drinking access to the water within said insulated tank, said drinking well being joined with said insulated cover portion at a peripheral edge of said drinking well to form a generally airtight seal therewith and having a lower continuous edge extending below said predetermined level to form an effective seal between the interior of said insulated tank and the ambient weather conditions and a continuous upper surface portion forming a closed loop; and

a lid pivotally connected with said insulated cover portion at a point spaced from said continuous upper surface portion, said lid being movable between an open and a closed position with respect to said drinking well and having a seat portion for engagement with said upper continuous surface along substantialy the entire length thereof when said lid is in a closed position.

4,100,886
AUTOMATIC HEADGATE FOR ANIMALS

Jerry D. Wade, Rte. 2, Box 76, and Phillip H. Geisler, Rte. 1, Box 40, both of Galena, Kans. 66739

Filed Aug. 26, 1976, Ser. No. 718,037
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—98 16 Claims



15. An automatic headgate for animals, comprising a rigid frame, gate means operatively mounted on the frame for movement between an open position and a closed position, force-applying means rendered operative in response to deformation thereof for biasing the gate means to the closed position, selectively operated means connected to the gate means and the force-applying means for simultaneously displaying the gate means to the open position and deforming the force-applying means to render the same operative, and lock means for holding the gate means against movement to the closed position under the bias of the force-applying means and releasable in response to opening pressure applied to the gate means in the open position thereof.

4,100,887
IMPROVMENTS IN OR RELATING TO BOILERS

Karl Gunnar Malmström, 1 Privatvägen, S-132 00 Saltsjö-boo, and Karl Lennart Mattsson, 28 Erstaviksvägen, S-130 12 Alta, both of Sweden

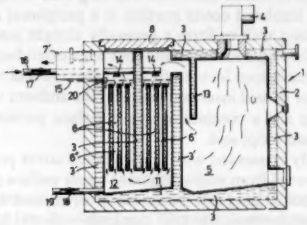
Filed Nov. 19, 1976, Ser. No. 743,180
Claims priority, application Sweden, Dec. 3, 1975, 75136101; Feb. 4, 1976, 7601220
Int. Cl.[2] F22B *37/52*
U.S. Cl. 122—379 7 Claims

1. A boiler of the type having convection surfaces located adjacent to and in communication with a combustion chamber,

a floor and upstanding walls forming a water-tight container for the convection surfaces with said walls extending sufficiently high to permit water to cover the convection

surfaces while permitting communication with the combustion chamber,

means for filling the water-tight container with water for



dissolving soot and other deposits on the convection surfaces to clean said surfaces, and

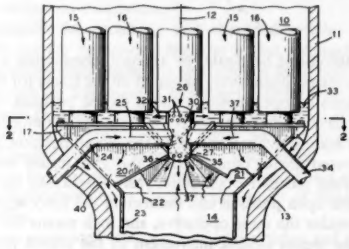
means for removing the contaminated water from the water-tight container.

4,100,888

VAPOR GENERATOR STEAM DRUM SPRAY HEAD

Floyd A. Fasnacht, Jr., Massillon, Ohio, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 667,053
Int. Cl.[2] F22D *11/00*
U.S. Cl. 122—438 **2 Claims**



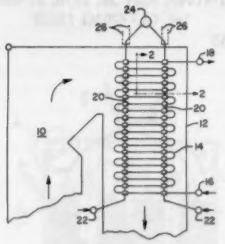
1. Apparatus for supplying feedwater and cooldown fluid to a steam drum comprising a wall that establishes a longitudinal center line within the steam drum, a feedwater spray head disposed within the steam drum having a longitudinal center line that is generally in alignment and coincident with said steam drum center line, said spray head having at least one feedwater discharge perforation formed in the surface thereof, a feedwater inlet pipe penetrating said surface to establish fluid communication with said spray head to enable feedwater to flow from said feedwater inlet pipe through said spray head and out through said perforation into said steam drum, a water tight diaphragm positioned within said spray head in order to divide the interior volume of said spray head into at least two portions, one of said two portions providing said fluid communication between said feedwater inlet pipe and said feedwater discharge perforation and the other portion of said two portions accommodating the cooldown fluid to control temperature within the steam drum.

4,100,889

BAND TYPE TUBE SUPPORT

Norman Chanine Chayes, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 7, 1977, Ser. No. 785,483
Int. Cl.[2] F22B *37/24*
U.S. Cl. 122—510 **1 Claim**



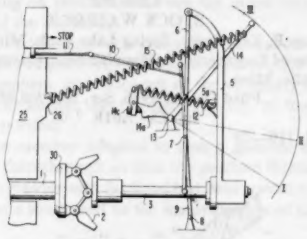
1. In combination, a vertical gas pass through which hot gasses flow, a heat exchanger including at least two horizontal, adjacent tube means, a tube support for the horizontal tube means including a vertical support tube positioned intermediate the two horizontal tube means, a pair of lugs, welded to opposite sides of the vertical tube, band means encircling the two horizontal tube means, the band means resting on and being supported by the lugs, said band means encompassing the vertical tube also, said band means being loose enough to permit relative movement between the two horizontal tube means, and also relative movement between the vertical tube and each of the horizontal tube means.

4,100,890

MECHANICAL GOVERNOR FOR INTERNAL COMBUSTION ENGINE

Koichi Mori, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,717
Claims priority, application Japan, Jun. 13, 1975, 50-79427[U]
Int. Cl.[2] F02D *1/04, 1/02, 1/00*
U.S. Cl. 123—140 R **2 Claims**



1. In a mechanical governor apparatus of a fuel injection pump for an internal combustion engine of the type having, a control lever the position of which is determined by the force on an accelerator pedal, a fuel determining control rod moveable by said control lever, a governor and a governor spring for exerting a force on said control lever opposite to that exerted on said pedal, and a balance spring connected between a housing and said control lever to oppose the force applied to said control lever by said accelerator and a means on said control lever for balancing the force of said governor spring, the improvement comprising, a first support member fixed to said housing, a second support member pivotally mounted on said control lever and adjustable with respect to said lever, one end of said balance spring being connected to said first support

member and the other being connected to said second supporting member.

4,100,891

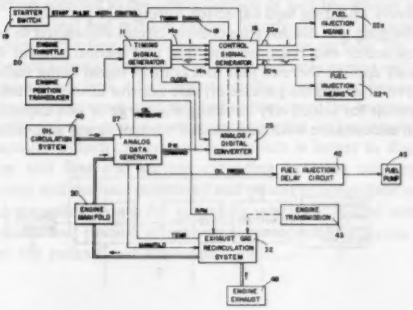
ELECTRONIC FUEL INJECTION CONTROL SYSTEM

Elmer A. Williams, San Angelo, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 7, 1974, Ser. No. 495,359

Int. Cl.[2] F02B 3/00

U.S. Cl. 123—32 EB **26 Claims**



1. An electronic system for controlling fuel injection into the cylinders of an internal combustion engine comprising:

timing signal generator means for generating a series of pulses in sequence, the leading edge of each of said pulses corresponding to the opening of the intake valve of one of the engine cylinders respectively,

means for generating a digital pulse count signal which varies with preselected engine parameters comprising means for generating a voltage having a magnitude inversely proportional to intake manifold vacuum, means for generating a voltage having a magnitude inversely proportional to engine temperature means for summing said voltages to provide a single analog signal, analog/digital converter means for converting said analog signal to a digital signal, and storage means for storing said digital signal, said analog/digital converter means including means for periodically generating an updated digital signal in accordance with a more current value of the analog signal and providing said updated signal to said storage means, and

control signal generator means responsive to the outputs of said timing signal generator means and said storage means for generating a pulse signal for controlling the fuel injection for each of the cylinders, each of said pulse signals having a leading edge which corresponds to the leading edge of a respective one of the pulse outputs of the timing signal generator means and a duration in accordance with said digital signal pulse count.

4,100,892

CLOSED-LOOP MIXTURE CONTROL FOR AN INTERNAL COMBUSTION ENGINE OF A ROADWAY VEHICLE WITH MEANS FOR COMPENSATING FOR FUEL DEFICIENCY DURING VEHICLE START-UP PERIODS

Masaharu Asano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 11, 1976, Ser. No. 685,255

Claims priority, application Japan, May 12, 1975, 50-54614; Dec. 6, 1975, 50-63691

Int. Cl.[2] F02B 3/00

U.S. Cl. 123—32 EE **2 Claims**

1. A closed-loop mixture control system for an internal combustion engine of a roadway vehicle, said engine including means for supplying air and fuel in a controlled ratio thereto, said system comprising:

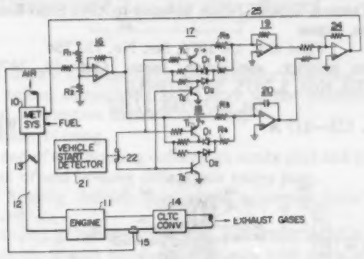
means for generating a first signal representing the concentration of an exhaust composition of the emissions from said engine;

means for comparing the first signal with a reference value to generate a second signal indicating the deviation of the air-fuel ration in said emissions from said reference value;

a vehicle start detector for generating an output only at the instant when the vehicle is being started from a rest, idle condition;

means for generating a compensating signal in response to the output from said vehicle start detector;

control amplifier means responsive to the second signal for



generating a control signal which adjusts said air-fuel supply means in the direction of the deviation of said air-fuel ratio in said emissions from said reference value;

a summation circuit providing summation of the control signal and the compensating signal so that the air-fuel supply means is adjusted to supply an enriched mixture to said engine when the vehicle is started from a rest, idle condition;

said vehicle start detector including means for generating a step change DC signal in response to the detection of said vehicle being started from a rest, idle condition, and said compensating signal generating means comprising a differentiator for differentiating the leading edge of the step change DC signal for enriching said air-fuel ratio supplied by said air-fuel supply means.

4,100,893

PRESSURE-RESPONSIVE TRANSDUCER FOR REGULATING INTERNAL COMBUSTION ENGINE

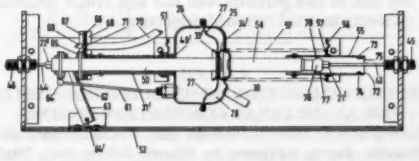
David Henry Butcher, Stanford House, Slinfold, near Horsham, Sussex, England

Filed Mar. 4, 1975, Ser. No. 555,302

Claims priority, application United Kingdom, Mar. 7, 1974, 10193/74

Int. Cl.[2] F02D 11/08

U.S. Cl. 123—103 B **14 Claims**



1. Apparatus for regulating an internal combustion engine having, for supplying air to the engine, a movable throttling device followed by an air intake duct and having an operator's control member linked with the engine for controlling the speed thereof, said control member being movable between a minimum speed position and a maximum speed position, said apparatus comprising a pressure responsive transducer adapted

for connection with the intake duct to respond to air pressure therein, mechanical output means responsive to the transducer, and thence to said air pressure, for actuation of the throttling device to oppose increase of said air pressure, when the control member is moved within a range extending from the minimum speed position to an intermediate position short of the maximum speed position and means separate from the transducer adapted and arranged to over-ride the mechanical output means and thereby prevent said opposition to increase of said air pressure when the control member is moved between said intermediate position and said maximum speed position.

4,100,894

FLOW RESTRICTOR

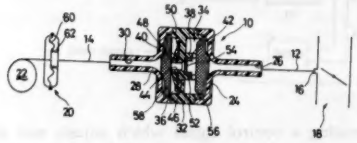
Tooru Tamura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 15, 1976, Ser. No. 732,754

Claims priority, application Japan, Oct. 16, 1975, 50-141226[U]; Nov. 5, 1975, 50-151199[U]

Int. Cl.[2] F16K *21/02*

U.S. Cl. 123—117 A **9 Claims**



1. A flow restrictor comprising:

a housing defining an enclosed chamber therein;

a partition wall, dividing said chamber into first and second separate pressure chambers each of which has a port connected thereto, and having at least one aperture for providing fluidic communication between said first and second chambers;

an annular, flexible, umbrella-shaped valve an inner portion of which is secured to said partition wall, said valve closing said at least one aperture for interrupting said fluidic communication between said first and second chambers when the vacuum in said first chamber is greater than that in said second chamber, and opening said aperture for establishing fluidic communication between said first and second chambers when the vacuum in said second chamber is greater than that in said first chamber;

an orifice member having an orifice and secured to said partition wall for permitting restricted fluidic communication between said first and second chambers; and

filter means positioned between said partition wall and each of said ports, the outer periphery portion of each filter being respectively securely sandwiched between said housing and said partition wall;

said partition wall, said valve, and said orifice member being coaxially arranged and wherein said partition wall is provided with a cylindrical projection axially projecting from one side of said partition wall and said orifice member is pressedly inserted into said projection.

4,100,895

ELECTRONIC IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori; Minoru Nishida, and Yoshiki Ueno, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 7, 1976, Ser. No. 730,594

Claims priority, application Japan, Oct. 13, 1975, 50-123662

Int. Cl.[2] F02P *5/00*

U.S. Cl. 123—117 R **10 Claims**

1. An electronic ignition timing control system for electronically controlling the ignition timing of an internal combustion engine having a crankshaft and having associated therewith ignition means responsive to an ignition signal applied thereto for effecting said ignition, said timing control system comprising:

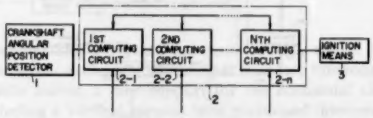
crankshaft angular position detecting means responsive to the angular position of said crankshaft for producing detection output pulses indicative of a period during which the crankshaft rotates between first and second predetermined angular positions; and

an ignition timing computing circuit including a plurality of individual computing circuits each thereof having:

an integration capacitor;

means responsive to said detection output pulses for selectively charging said capacitor during said period;

a charging and discharging control circuit connected to said capacitor and responsive to first and second control signals applied thereto, said first control signal being indicative of an engine parameter, said control circuit including means for selectively initiating discharge of said capacitor in accordance with said second control signal and, means



for varying at least one of the charging and discharging currents of said capacitor in accordance with said engine parameter;

a capacitor voltage detecting circuit connected to said capacitor and responsive to the voltage across said capacitor for generating a discharge termination output signal indicative of said capacitor being discharged to a predetermined value; and

said respective individual computing circuits being connected in a predetermined sequence, the discharge termination output signal of the just previous individual computing circuit in said sequence being applied as said control circuit second control signal to the next successive individual computing circuit in said sequence, said detection output pulses being applied to the first computing circuit in said sequence as said control circuit second control signal, and said discharge termination output signal of the last individual computing circuit in said sequence being applied as said ignition signal to said ignition means.

4,100,896

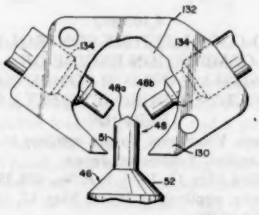
COMPUTER CONTROLLED SONIC FUEL SYSTEM

Arthur K. Thatcher, Merritt Island, Fla. 32952, and Ed R. McCarter, 1521 Sunnyside Dr., Maitland, Fla. 32751

Division of Ser. No. 293,377, Sep. 29, 1972, Pat. No. 3,893,434. This application Jul. 3, 1975, Ser. No. 593,001

Int. Cl.[2] F02M *27/08*

U.S. Cl. 123—119 EE **10 Claims**



1. A sonic fuel system for providing fuel from a fuel source to the air stream to the intake manifold of an internal combustion engine comprising fuel input means connected to provide fuel from said fuel source, sonic means for receiving fuel from

said fuel input means and providing a fuel dispersion to said airstream, said sonic means including transducer means having an active surface for producing sonic wave energy, power concentrator means secured to the active surface of said transducer means and having a concentrator active surface which is of a smaller area than the area of the active surface of the transducer means spaced from the active surface of said transducer means, said power concentrator means operating to concentrate the sonic wave energy from the active surface of said transducer means at said concentrator active surface and including an elongate body portion extending from a base portion secured to the active surface of said transducer means to a terminal end portion spaced therefrom, said terminal end portion including said concentrator active surface, the elongate body portion of said power concentrator means including a tapered section, a first, substantially cylindircal end section extending between said tapered section and the terminal end portion of said power concentrator means, and a second substantially cylindrical end section which is larger in diameter than said first end section extending between said tapered section and the base portion of said power concentrator means, and mounting means for mounting said sonic means with the terminal end portion of said power concentrator means adjacent the path of said airstream.

4,100,897

APPARATUS FOR REGULATING THE FUEL-AIR MIXTURE DELIVERED TO AN INTERNAL COMBUSTION ENGINE

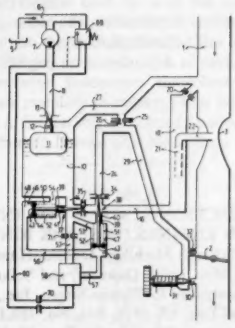
Johannes Brettschneider, Ludwigsburg; Gerhard Bertling, Vaihingen, and Hans Georg Zeller, Grafenau, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 2, 1976, Ser. No. 737,978

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552207

Int. Cl.² F02B *33/00*; F02D *35/00*

U.S. Cl. 123—119 EC **27 Claims**



1. In an apparatus for regulating the fuel-air mixture delivered to an internal combustion engine including: a carburetor having a fixed venturi; a fuel chamber; at least one orifice defining means; at least one throttle device connected to the fuel chamber and the orifice defining means, and actuated by a variable fuel pressure for varying the cross-sectional flow area of the orifice defining means and thereby influencing the fuel-air mixture in accordance with parameters characterizing the operational behavior of the engine.

4,100,898

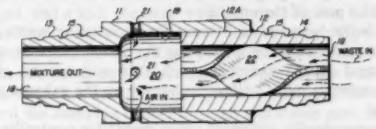
COMBINATION CRANKCASE VENTILATION VALVE AND SUPPLEMENTARY CARBURETOR

Fred Mineck, Phoenix, Ariz., assignor to Dorothy J. Archer, Phoenix, Ariz.; Jay A. Mineck, Montclair, Calif. and Warren F. B. Lindsley, Phoenix, Ariz., part interest to each

Filed May 26, 1977, Ser. No. 800,727

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 B **13 Claims**



1. A device for ventilating and aerating crankcase gaseous fumes before transmitting said fumes to the manifold of an internal combustion engine comprising:

a tubular housing,

one end of said housing defining an intake port and the other end of said housing defining an outlet port,

said housing defining therewithin a gaseous fume mixing chamber,

a plurality of openings spacedly positioned around the periphery of said housing forming air inlet ports interconnecting atmospheric air with the interior of said chamber,

a deflecting vane mounted within said housing for swirling the gaseous fumes received through said intake port and discharging said swirling gases into said chamber, wherein the swirling gaseous fumes are aerated by air injected into said swirling gaseous fumes prior to discharge out of said outlet port, and

a valve assembly,

said assembly being mounted within said intake port of said housing for receiving and venting through said housing the crankcase fumes,

said outlet port of said housing being connectable to an intake manifold of the internal combustion engine.

4,100,899

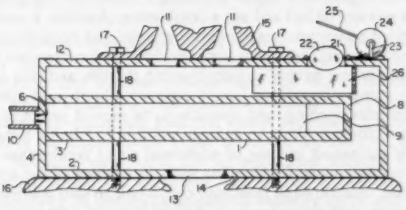
CARBURETOR HEATER

Robert S. Chilton, Route 1, Lawton, Iowa 51030

Filed Nov. 12, 1976, Ser. No. 741,317

Int. Cl.² F02M *31/08*

U.S. Cl. 123—122 A **5 Claims**



1. An apparatus for improving the combustion characteristics of an air/fuel mixture for an engine, the engine having a carburetor for introducing an air/fuel mixture into the intake port of an engine block, the apparatus being so positioned to allow a fluid flow from the carburetor through the apparatus and into the intake port of the engine block, said apparatus comprising:

(a) a first closed chamber having a top and an opposing bottom, including first and second openings in said top and bottom, respectively and further including a supplemental opening therein;

(b) a second closed chamber positioned within said first

chamber allowing a fluid flow passage from said first opening in said first closed chamber to said second opening in said first closed chamber;

(c) means for introducing and means for exhausting warm gases into and out of said second closed chamber, such that the air/fuel mixture from the carburetor is passed through said first opening in said first closed chamber, around said second closed chamber where the air/fuel mixture is at least partially vaporized, and through said second opening in said closed first chamber, through the intake port of the engine;

(d) a baffle between said means for introducing warm gases and said means for exhausting the warm gases from said second closed chamber, such that said second closed chamber is more uniformly heated by the exhaust gases; and

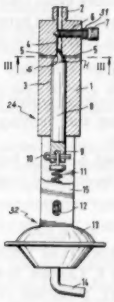
(e) pneumatically activated valve means for controlling the volume of fluid flow into said first chamber through said supplemental opening, wherein the pneumatically activated valve means is responsive to pressure variations of the fluid flow through the apparatus.

4,100,900

METHOD AND APPARATUS FOR CONTROLLING THE AIR OF COMBUSTION OF CARBURETOR ENGINES

Wilhelm Straub, Bruno de Ezeta 12, Circuito Navegantes, Cd. Satelite, Edo, Mexico

Filed Jun. 1, 1976, Ser. No. 691,786
Int. Cl.[2] F02M *23/04*
U.S. Cl. 123—124 R **2 Claims**



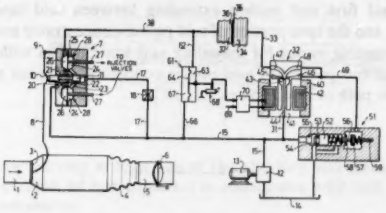
1. Apparatus for controlling the air of combustion of a carburetor engine, said engine including a carburetor for producing a mixture of fuel and air, a combustion chamber, a vacuum operated pneumatic spark control system, and conduit means connecting said carburetor with said combustion chamber, said conduit means having an inlet opening therein, and said apparatus comprising: valve means connected with said conduit means inlet opening, and operable to be moved progressively from a closed position to an open position to admit a progressively increasing volume of additional air of combustion into said conduit means for blending with the mixture of fuel and air flowing therethrough from said carburetor to said combustion chamber, said valve means including: a valve body having a main bore and a reduced outlet bore therein, connected by a frusto-conical valve seat, said outlet bore being connected to said conduit means inlet opening, and said valve body further having at least one air inlet bore, said air inlet bore opening on said valve seat and extending tangentially to the longitudinal axis of said main bore whereby to encourage turbulence in the air flowing through said valve; and a valve stem received in said main bore, and having a conical head thereon that is engageable with said valve seat to close said valve; and actuator means connected to operate said valve means between said closed and said open positions in direct dependency upon the rotational speed of said carburetor engine, said actuator means including: an actuator housing having a diaphragm mounted therein, said diaphragm being connected with the vacuum of the pneumatic spark control system of said carburetor engine and being operated thereby; an operating stem carried by said diaphragm and connected directly with said valve stem; and resilient means mounted and arranged to urge said valve stem toward a valve "closed" position against valve opening force generated by said diaphragm.

4,100,901

FUEL INJECTION SYSTEM

Manfred Krämer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 20, 1976, Ser. No. 650,734
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1975, 2502159
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AW **11 Claims**



1. In a fuel injection system for internal combustion engines, said system including a fuel tank, a source of pressurized fuel, fuel injection valves and a fuel metering and distributing assembly for simultaneous metering of fuel to said injection valves, and further including diaphragm valves disposed between said distributing assembly and each of said injection valves, each of said diaphragm valves having a first and second chamber, said first chamber being exposed to fluid pressure downstream of said distributing assembly in the valve-opening sense, the improvement comprising:

a fluid pressure modulator with an outlet which is connected to said second chamber in at least one of said diaphragm valves, said pressure modulator having internal fluid passages and including electromagnetically actuated means for directing the flow of fluid selectively through said passages, thereby determining the static pressure at said outlet and in said second chamber for controlling the fluid pressure therein in dependence on engine data;

a pressure transformer connected between said second chambers and said pressure modulator; and

each of said second chambers is connected in fluid communication with each other said second chamber.

4,100,902

FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES OF SPARK IGNITION TYPE

Tooru Kosuda, Okazaki; Michihiro Ohashi, Handa; Eiji Tanaka, Anjo; Hiroshi Mochizuki, Okazaki, and Seikou Abe, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 13, 1976, Ser. No. 750,192
Claims priority, application Japan, Dec. 16, 1975, 50/150380
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 BC **14 Claims**

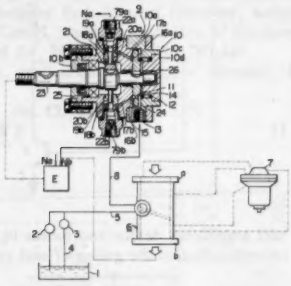
1. A fuel injection system for an internal combustion engine of spark ignition type comprising:

a fuel metering means for controllably metering a continuous flow of fuel fed to said internal combustion engine in dependence upon flow rate of intake air inducted to said engine;

a fuel distributing device comprising a plurality of fuel receiving ports provided in number equal to that of the

cylinders of said engine and a fuel distributing means adapted to sequentially communicate with said fuel receiving ports as driven by said engine thereby to distribute the metered fuel received from said fuel metering means to said receiving ports;

a fuel pressure-feeding means comprising a plurality of chambers equal in number to the cylinders of said engine and each communicated with each of said fuel receiving ports, fuel pressure-feeding members watch reciprocally accommodated within each of said chambers, driving means for driving said fuel-feeding members at predetermined cycle to perform the reciprocal movements within



said chambers depending upon the revolution number of said engine, and discharge valves each connected to each of said chambers, said discharge valves being opened when a pressure in said chambers exceeds a predetermined level, thereby to pressure feed intermittently said distributed fuel from said fuel distributing means in accordance with said reciprocal movements of said pressure-feeding members; and

fuel injection valve means provided in number equal to that of the cylinders of said engine and communicated with said chambers of said pressure-feeding means to receive intermittently supplied fuel thereby to feed the received fuel into the associated cylinders of said engine.

4,100,903

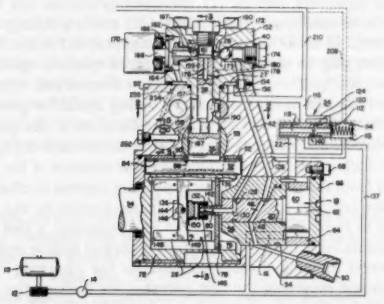
ROTARY DISTRIBUTOR FUEL INJECTION PUMP

Vernor D. Roosa, West Hartford, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Dec. 13, 1976, Ser. No. 750,276

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AQ **37 Claims**



1. A liquid fuel injection pump suited for the delivery of measured charges of liquid fuel under high pressure sequentially to the cylinders of an associated engine comprising a pump chamber wherein the charges are pressurized to high pressure, a pump plunger reciprocably mounted in said pump chamber, a stop for said pump plunger to limit the maximum volume of said chamber, mechanical means for driving said pump plunger in a direction to reduce the volume of said pump chamber to pressurize the fuel therein, hydraulic means to power said pump plunger in the opposite direction, said hydraulic means including a passage containing fuel under pressure in continuous communication with said pump chamber, a one way valve in said passage unseated by the pressure therein after the release of the pump plunger by said mechanical means to power the plunger against said stop and fully charge said pump chamber priorto each pumping stroke of the pump plunger, and a spill chamber which communicates with a spill port of said pump plunger to terminate the pumping stroke of said pump plunger by spilling the remainder of the charge of fuel in said pumping chamber, a dump port in the wall of said spill chamber, a spring biased piston in said spill chamber to control the dumping of fuel through said dump port, said spill chamber communicating with said pump chamber upon the release of the pump plunger by the mechanical means to provide an auxiliary quantity of fuel to assist in the charging of the pump chamber during the subsequent charging stroke of the pump plunger.

4,100,904

FUEL INJECTION SYSTEM

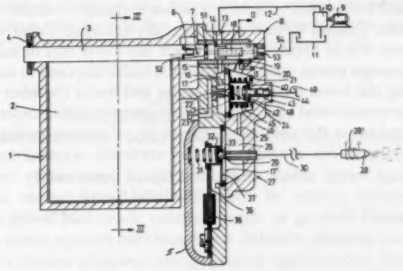
Konrad Eckert, Stuttgart; Heinrich Knapp, Leonberg-Silberberg, and Gerhard Stumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 507,076, Sep. 18, 1974, abandoned. This application Jan. 11, 1977, Ser. No. 758,369

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1973, 2348860

Int. Cl.[2] F02M *37/14*

U.S. Cl. 123—139 AW **11 Claims**



1. In a fuel injection system for mixture compressing, externally ignited internal combustion engines, which provides continuous fuel injection into the induction tube of the engine and which includes a fuel pump, a housing, a displaceably mounted air measuring member, means providing a resetting force to the displacement of the air measuring member, and a fuel metering valve with the air measuring member being mounted within the induction tube of the engine in series relation with an arbitrarily adjustable butterfly valve, and with the fuel metering valve being mounted within the housing and having a movable valve member which is displaced by the movements of the air measuring member so as to provide fuel metering in proportion to the air flow, the improvement comprising:

means for changing the fuel pressure downstream of the fuel metering valve in the fuel injection line whereby the fuel air mixture ratio is mediately changed; and

means for changing the differential pressure across the metering valve, which operate in response to the change in the fuel pressure downstream of the fuel metering valve,

wherein said means for changing the differential pressure includes:

a differential pressure valve connected to the fuel metering valve for setting the pressure differential across the fuel metering valve, said differential pressure valve being embodied as a flat-seat diaphragm valve;

a differential pressure spring, for biasing the differential pressure valve in the direction of closure;

a warm-up piston, slidingly disposed in the housing; and

a warm-up spring, said warm-up spring biasing the differential pressure valve in the direction of closure; whereby said warm-up piston mediately supports one end of said differential pressure spring and mediately supports one end of said warm-up spring.

4,100,905

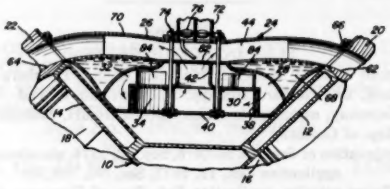
FUEL VAPORIZER

Joe M. Nolan, P. O. Box 1263, Longview, Tex. 75601

Filed May 31, 1977, Ser. No. 802,242

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **9 Claims**



1. A fuel vaporizer for a V-type internal combustion engine, said vaporizer comprising a hollow intake manifold-type body for mounting between the cylinder banks of a V-type engine, said hollow body including means defining vertically oriented inlet passage means, a horizontally enlarged lower chamber into whose upper central portion the lower end of said intake passage means opens, a horizontal baffle disposed in and dividing the lower chamber into upper and lower chamber sections communicated with each other in corresponding outer peripheral zones thereof spaced outwardly of corresponding peripheral portions of said baffle, and vertically oriented outlet passage means whose lower end opens downwardly through a central portion of said baffle, said body further including means defining an upper chamber above said lower chamber and vertically through which said inlet passage means extends, said outlet passage means opening upwardly centrally into said upper chamber, said body additionally including means defining peripherally spaced intake runner passages opening outwardly of opposite sides of said body at points spaced therealong for registry with inlet ports formed in cylinder heads mounted on said cylinder banks, and a fuel and air charge forming device having an outlet end coupled to the upper end of said inlet passage.

4,100,906

PULSE GENERATOR FOR ENERGY DISCHARGE SYSTEM

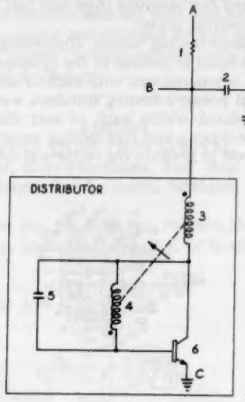
Floyd M. Minks, Rte. 1, Box 66, Kissimmee, Fla. 32741, and Floyd A. Minks, Box 252, Ridgetop, Tenn. 37152

Continuation-in-part of Ser. No. 181,445, Sep. 17, 1971, Pat. No. 3,837,325. This application Apr. 16, 1974, Ser. No. 461,392

Int. Cl.[2] F02P *5/04, 1/00*

U.S. Cl. 123—148 E **3 Claims**

1. In an ignition system a gated oscillator containing a variable magnetic circuit for controlling said oscillator, an amplifying device to supply the gain required for oscillation, a source of power for said amplifying device, a bias network for supplying power from said power source to establish the steady-state operating point of said amplifying device such that variations in the voltage of said source of power vary the steady-state current through but has little effect on the steady-state voltage



across said amplifying device and means to produce ignition pulses corresponding to the gating of said gated oscillator.

4,100,907

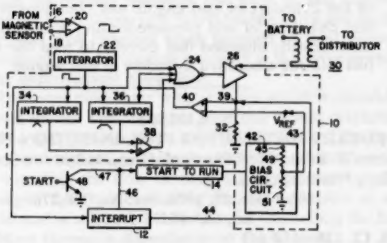
START-TO-RUN CIRCUIT FOR AN ELECTRONIC IGNITION SYSTEM

William F. Davis, and Wilson David Pace, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1976, Ser. No. 702,155

Int. Cl.[2] F02P *11/00, 9/00, 15/00*

U.S. Cl. 123—148 S **17 Claims**



1. In an ignition system suitable to receive timing signals generated in timed relationship to engine rpm for discharging and charging an ignition coil to produce spark to operate the engine, the ignition system including a first circuit responsive to the initiation of each successive timing signal for generating an output signal of a predetermined duration, a charging current circuit coupled between the first circuit and the ignition coil which is rendered conductive in the absence of the output signal from the first circuit for providing current to charge the ignition coil and being rendered nonconductive by the output signal to cause the ignition coil to be discharged, a bias circuit for producing a first potential during normal engine operation, a current limiting circuit coupled to the charging current circuit and receiving the first potential for limiting the magnitude of the charging current to a value determined by said first potential, the improvement comprising in combination:

interrupt circuit means having an input coupled to the output of the first circuit and an output coupled to the current limiting circuit for producing an output signal to cause the current limiting circuit to prevent charging of the ignition coil when the engine rpm is below a predetermined rpm such that engine operation is inhibited; and

start-to-run circuit means having an input coupled to said interrupt circuit means and an output coupled to the bias circuit for causing the magnitude of the first potential to be increased to a second potential during starting of the engine such that the current conducted through the ignition coil is increased during engine starting conditions to facilitate engine start-up.

4,100,908

SEMICONDUCTOR IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

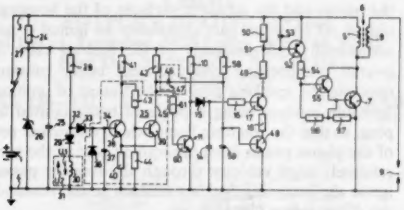
Reinhard Leussink, Vaihingen, Enz, and Walter Ruf, Korntal-Munchingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 21, 1976, Ser. No. 707,320

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533082

Int. Cl.² F02P *3/04, 3/00*

U.S. Cl. 123—148 E **11 Claims**



1. Semiconductor ignition system for an internal combustion engine comprising an ignition coil (6);

a main switching transistor (7) connected in series with the primary (5) of the ignition coil (6);

an ignition breaker switch (11) connected to and controlling conduction or blocking of the switching transistor (7) in accordance with commanded ignition events;

a control circuit including a control capacitor (14) and a control transistor (17) connected to the switching transistor (7) to control the switching transistor to non-conduction or blocked state if the engine should be stopped with the ignition breaker switch (11) closed,

and a capacitor discharge circuit (16, 18;) for the control capacitor (14) dimensioned for gradual discharge of the capacitor, and connected to the base-emitter path of the control transistor (17), the collector-emitter path of the control transistor being connected to control conductivity of the switching transistor (7) so that discharge of the control capacitor (14), gradually, through said base-emitter path of the control transistor (17) will gradually change the conductivity of its collector-emitter path and hence provide for gradual change of conductivity of the main switching transistor (7) and gradual change-over to blocked state thereof and hence prevent generation of a high-voltage pulse in the secondary (8) of the coil (6).

4,100,909

LUBRICATION SYSTEM FOR AIR-COOLED ENGINES

Keiichi Nakano, and Kouji Nakai, both of Sakaishi, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 26, 1977, Ser. No. 790,974

Claims priority, application Japan, Jan. 24, 1977, 52/7140

Int. Cl.² F01M *1/00*

U.S. Cl. 123—196 AB **7 Claims**

1. In an air-cooled engine having an air-cooled lubrication system, the combination of:

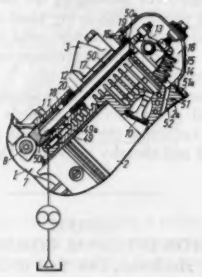
a crankcase having a chamber therein, the lower portion of said crankcase chamber being a reservoir for containing lubricating oil;

at least one cylinder mounted on said crankcase to project therefrom, said cylinder having cooling fins thereon and being provided with a head chamber at its head end;

valve means associated with said cylinder, and including valve operating arm means housed within said head chamber;

push rod means associated with said valve operating arm means, and including at least one push rod extending between said head chamber and said crankcase;

housing means enclosing said push rod, and forming an annular supply passage thereabout;



a lubricant pump mounted within said crankcase chamber and arranged to be at least partially immersed in lubricating oil contained in said reservoir portion of said chamber, whereby the operating chamber of said pump is assured to contain lubricating oil before start-up;

passage means connecting said lubricant pump with said annular supply passage, to supply lubricating oil to said head chamber; and

return passage means leading from said head chamber to said crankcase chamber, said return passage means extending through said cooling fins whereby air flowing over said fins is effective to cool the returning lubricating oil.

4,100,910

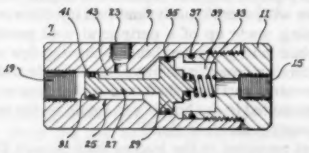
PRESSURE RATIO VALVE

Bill G. Davis, Phoenix, Ariz., assignor to Jetco, Inc., Phoenix, Ariz.

Filed Mar. 18, 1977, Ser. No. 778,851

Int. Cl.² F01M *1/00, 1/18*

U.S. Cl. 123—196 S **10 Claims**



1. In an engine having engine protection means for reducing the engine RPM to a safe level in response to an engine oil pressure below an acceptable level, and a fuel pump for supplying fuel at a pressure linearly related to the engine RPM, a valve for continuously sensing both the oil pressure and the fuel pressure of the engine, and for reducing the engine oil pressure below the acceptable level in response to a fuel pressure-oil pressure ratio in excess of a predetermined magnitude, said valve comprising in combination:

a. a body defining an internal, longitudinally extending bore;

b. an oil inlet port providing a passage for entry of oil under pressure into said bore;

c. a fuel inlet port providing a passage for entry of fuel under pressure into said bore;

d. an oil outlet port communicating with said bore;

e. a piston slidably moveable in said bore interposed between said oil inlet port and said fuel inlet port, said piston hav-

ing a first pressure receiving heat communicating with said oil inlet port and a second pressure receiving head communicating with said fuel inlet port, said piston having a first position wherein said first pressure receiving head is in blocking relationship between said oil inlet port and said oil outlet port, and a second position wherein said first pressure receiving head is in non-blocking relationship between said oil inlet port and said oil outlet port, and

f. biasing means exerting a predetermined force urging said piston into the first position, said predetermined force being sufficient to maintain said piston in the first position so long as the force exerted by the fuel under pressure on said second pressure receiving head does not exceed the combination of said predetermined force and the force exerted by said oil under pressure on said first pressure receiving head;

whereby said piston is urged into the second position when the fuel pressure-oil pressure ratio exceeds the predetermined magnitude for reducing the engine oil pressure below the acceptable level and thereby activating the engine protection means.

4,100,911

ROTARY PISTON INTERNAL COMBUSTION ENGINE

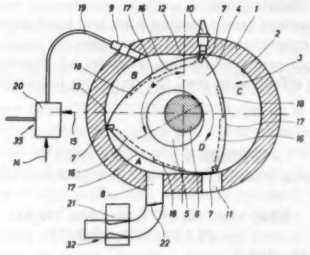
Günter Krömer, Heilbronn, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 3, 1976, Ser. No. 720,247

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540702

Int. Cl.² F03B *53/10*

U.S. Cl. 123—205 **5 Claims**



1. A rotary piston internal combustion engine of trochoidal construction with spark ignition and fuel injection comprising:

a. a housing made up of a peripheral wall portion with a two-lobed inner peripheral surface having first and second nodes on its minor axis and two parallel side wall portions;

b. an eccentric carrying shaft and a three-cornered piston being mounted in the housing to rotate on the eccentric of the eccentric-carrying shaft;

c. a recess provided in the leading half of each flank of the piston, looking in the direction of rotation, said recesses defining together with the inner peripheral surface of the housing variable volume working chambers;

d. a transfer passage extending from the recess of each flank into the region of the trailing half of the flank;

e. an inlet passage, with a fuel metering device and a throttle valve, located in the housing near the first minor-axis node;

f. an exhaust port in the housing near the first minor-axis node for the excape of burnt gases;

g. at least one sparking plug mounted in the region of the peripheral surface where compression takes place, said sparking plug being placed at a point following the second node looking in the direction of rotation of the piston in the region in which, at the instant of passage of an apex seal of the piston, substantially equal pressure prevail in the two adjacent working chambers;

h. at least one injection nozzle mounted in the region of the inner peripheral surface where compression takes place, said injection nozzle being mounted ahead of the second node, looking in the direction of rotation, and arranged in an inclined manner to spray fuel towards the piston in such a way that the stream of fuel is directed into the recess during rotation of the piston in a region between 40° and 100° eccentric angle ahead of top dead center resulting in a local enrichment of the fuel/air mixture in the recess;

i. a fuel control device regulating the quantity of fuel fed to the fuel metering device and the injection nozzle so that there is always present in the recess at the instant of ignition a fuel/air mixture of 0.9 to 1.1 λ substantially independently of fuel/air ratio in the working chambers, the overall quantity of fuel when the throttle is closed being supplied mainly to the injection nozzle, whereas in the remaining conditions of operation, it is supplied through the fuel metering device; and

j. in the substantially top dead center position of the piston an overall compression chamber is formed and an essentially closed off chamber part is formed by the recess in the piston and the adjacent surfaces of the housing, said closed off chamber part containing an ignitable mixture substantially independently of the fuel/air ratio in the overall compression chamber and being substantially opposite the sparking plug at the instant of ignition, the ignitable mixture being capable of being ignited by the plug, so that the resulting flame which on further rotation of the piston passes from the trailing part of the recess at relatively high velocity through the transfer passage to ignite the incoming fuel/air mixture in the remainder of the compression chamber.

4,100,912

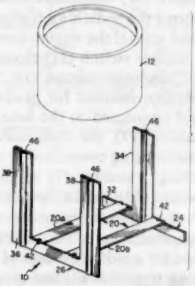
PORTABLE CAMP STOVE

Tuthill Doane, 373 School St., Westbury, N.Y. 11590

Filed Jul. 16, 1976, Ser. No. 705,773

Int. Cl.² F24C *15/08*

U.S. Cl. 126—43 **9 Claims**



1. In combination: a container of cooking fuel having a given height and a portable camp stove for supporting the container during use above a given plane and a cooking utensil over said container, said stove comprising:

a flat blank of bendable sheet metal or the like having means defining elongated slots therein for delineating

(i) a container support,

(ii) a first side member connected to said support along at least one first bending line and having a first portion disposed on one side of said first bending line and a second portion disposed on the other side of said first bending line and

(iii) a second side member connected to said support along at least one second bending line and having a first portion disposed on one side of second bending line and a second portion disposed on the other side of said second bending

line, wherein the second portions of each of said side members have a length greater than said given height and are disposed parallel to each other and configured to closely receive said container therebetween when the stove is erected and said container rests upon said support; and

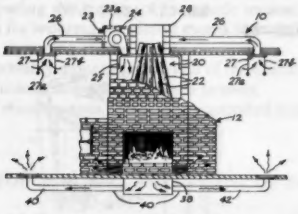
wherein said stove is erected by inwardly bending said first and second side members with respect to said container support along said first and second bending lines respectively, disposing each side member substantially perpendicular to said support wherein said first portions of said side members are positioned below said support for disposing the support above the given plane and wherein said second portions of said side members are simultaneously disposed above said support while maintaining the coplanar relationship between said first and second portion of each side member for supporting a utensil placed thereon over said support and thereby over said fuel container resting thereon.

4,100,913

FIREPLACE HEATING SYSTEM

Ernest DeLoy Armstrong, 5523 Latigo, Boise, Id. 83705

Filed Oct. 29, 1974, Ser. No. 518,414
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **2 Claims**



1. A fireplace heating system for a building structure comprising, in combination,

(a) a fireplace including a firebox,

(b) a chimney,

(c) a heat exchanger bounded in part by the firebox and including a multiplicity of heat conductive metallic tubes which connect the fireplace with the chimney, whereby the hot products of combustion are all adequately conducted to the chimney for discharge to the outside atmosphere, the heat exchanger including a chamber of larger flow capacity than the combined tubes, through which chamber the tubes pass,

(d) means for withdrawing breathable air from the top of a room and propelling it downward through said chamber of the heat exchanger for exposure to contact with the outsides of the tubes thereof,

(e) means for delivering the reheated air from the heat exchanger to the lower, habitable part of a room of the building, said withdrawing and delivering means having a flow capacity nearly enough comparable to that of the heat exchanger chamber to avoid objectionable overheating of the returned air and also to avoid discharge of the returned air at an objectionably high velocity, and

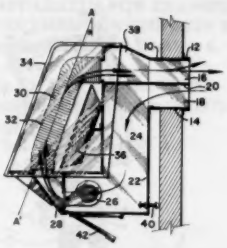
(f) a firm support for the fireplace, said support including a tier composed essentially of hollow concrete blocks disposed above floor level and constructed and arranged to form continuously open passage means volumetrically proportioned to deliver moderately reheated, returned air at low velocity and in substantial quantity to the room in which the fireplace is located, at points substantially at floor level.

4,100,914

SOLAR ENERGY COLLECTOR

Salvion Ed Williams, 6531 S. Atchinson Wy., Englewood, Colo. 80110

Filed Jun. 13, 1977, Ser. No. 798,637
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



1. In a solar energy collector having a reflector and a plurality of tubular members in sealing engagement between an upper warm air dispensing manifold and a lower cool air collecting manifold wherein the improvement comprises, in combination:

(1) A substantially horizontal housing section adapted for insertion into an opening in the wall of a building, such as an existing window frame, said horizontal section containing an upper duct for dispensing warm air into the building and a separate lower duct for collecting relatively cool air from within the building;

(2) a substantially vertical housing section which is attached to the horizontal housing section, said vertical housing section containing,

(a) an air intake duct in air carrying connection with the lower duct of the horizontal housing section,

(b) an air pumping means,

(c) a lower manifold for directing the cooler air dispensed by the pumping means into a plurality of tubular members,

(d) a plurality of opague coated corrugated metal tubular members in air carrying connection between the lower manifold and an upper manifold, wherein air is heated by the action of the sun's rays on the outer walls of said tubular members and rises in the tubular members to the upper manifold through both the natural tendency of warm air to rise, and the action of the air pumping means,

(e) an upper manifold for collecting the rising warm air and directing said air into the upper duct of the horizontal housing section,

(3) a reflecting surface on the side of the tubular members away from the sun and being substantially coextensive with said tubular members, said reflecting surface being positioned a distance not more than four times the diameter of the tubular members which are farthest away from the reflecting surface;

(4) a transparent enclosure which engages between the lower manifold, the upper manifold, and the two vertical sides of the vertical housing section to enclose the tubular members.

4,100,915

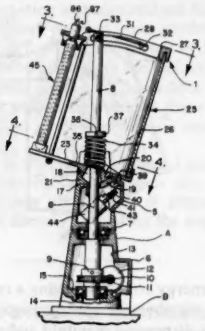
SOLAR ENERGY HEATING APPARATUS

Ingemar Carlson, Nybrovag 6, 78100 Borlange, Sweden

Filed Feb. 18, 1977, Ser. No. 770,096
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **17 Claims**

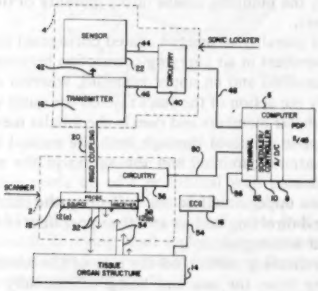
1. In a solar heat collector, a support, means carried thereon for absorbing solar heat,

said means comprising first dark heat absorbent surfaces disposed for direct impingement by solar rays,
said means comprising other highly polished reflective surfaces,
said first heat absorbent surfaces having an angle of incidence with the sun rays for deflecting at least a portion of said rays toward said reflective surfaces,



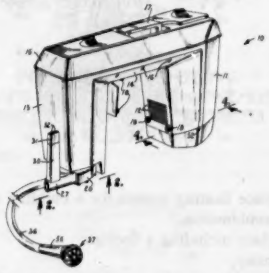
and said means having other second dark heat absorbent surfaces disposed both to direct impingement by the sun's rays and also to the reflected rays,
and means for conducting heat from both heat absorbent surfaces to a use area.

4,100,916
THREE-DIMENSIONAL ULTRASONIC IMAGING OF ANIMAL SOFT TISSUE
Donald L. King, 19 Searles Rd., Darien, Conn. 06820
Filed Apr. 27, 1976, Ser. No. 680,885
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V **16 Claims**



1. An apparatus for collecting three-dimensional data on the size, shape, location and nature of animal soft tissue organ structures within the animal and reconstructing the data outside the animal to provide a representation of the size, shape, location and nature of the structure in three dimensions which comprises:
(a) a first means having:
(i) a source transmitting acoustical waves into the tissue; and
(ii) a receiver for receiving waves from the tissue and detecting measurable physical characteristics of the waves
and the first means producing electronic output signals corresponding to the characteristics of the waves;
(b) a second means having:
(i) a transmitter means which remains in a known spatial relationship with respect to the source and receiver of the first means, and emits into space a plurality of energy waves from a plurality of discrete points; and
(ii) a sensing means which is spaced from the transmitter means and senses each energy wave from each discrete point of the transmitter means in three dimensions known as X, Y and Z
and the second means producing electronic output signals corresponding to each wave from the plurality of discrete points; and
(c) a computer means electrically coupled to the first and second means receiving the output signals from the first and second means and processing and assembling the data transmitted by the signals and displaying the data in a form for determining one or more of the size, shape, location and nature of the tissue in three dimensions.

4,100,917
HYDROTHERAPY UNIT
Henry J. Talge, Leawood; Samuel L. McNair, and Verne L. Zugenbuhler, both of Kansas City, all of Mo., assignors to Dazey Products Co., Industrial Airport, Kans.
Filed Oct. 18, 1976, Ser. No. 733,231
Int. Cl.[2] A61H *9/00*
U.S. Cl. 128—66 **22 Claims**

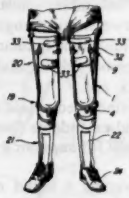


1. Hydrotherapy apparatus for circulating water in a tub, said apparatus comprising:
a frame;
a pump housing mounted on said frame at a location to be immersed in the water, said pump housing having an inlet for receiving water and first and second outlets for discharging water, said first outlet directing water into the tub for circulation therein;
an accessory operable to receive and apply the water from said second outlet;
means for coupling said accessory with said second outlet to receive water therefrom;
an air tube disposed in communication with said first outlet to deliver air thereto, said air tube having an air inlet located above the water level in the tub for receiving air; and
a hollow aspirating member located partially in said air tube and presenting a conduit which provides communication between said air tube and first outlet, said member having an upstream portion and a downstream portion, said upstream portion projecting into said first outlet a greater distance than said downstream portion, whereby suction is caused by water flowing through said first outlet to induce air flow through said air tube and into said first outlet by aspiration.

4,100,918
DYNAMIC ORTHOTIC KNEE EXTENSION ASSIST DEVICE

John Glancy, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Mar. 25, 1977, Ser. No. 781,123
Int. Cl.[2] A61F *3/00, 5/00*
U.S. Cl. 128—80 F **6 Claims**

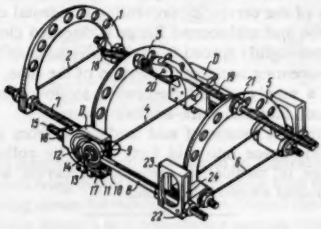


1. A dynamic knee extension assist orthotic device comprising:
cuff means adapted to be secured to a patient's thigh;
mounting means adapted to be secured to the patient's leg below the knee;
knee brace means rigidly secured between the mounting means and the cuff means;
elongated elastic means capable of exerting a predetermined force;
means for adjusting the tension of the elastic means;
pivotal means for securing the elastic means intermediate its ends to the mounting means; and
means for removably mounting each end of the elastic means to the cuff means at a predetermined tension;
whereby, the elastic means provides a controlled knee.

4,100,919
APPARATUS FOR SURGICAL TREATMENT OF BONES AND JOINTS

Oganes Vardanovich Oganesyan, and Nikolai Ivanovich Pyanov, both of Moscow, U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Institut Travmatologii I Ortopedii Imeni N.N. Priorova, U.S.S.R.

Filed Dec. 8, 1976, Ser. No. 748,753
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—84 B **10 Claims**

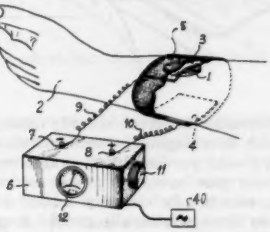


1. An apparatus for the surgical treatment of bones and joints, comprising at least a supporting and a rotatable stirrups, wire spokes secured in said stirrups and intended for being drawn through juxtapositional segments of bones or joints, said rotatable stirrup and the spokes associated therewith forming a rigid system, while said supporting stirrup and the spokes associated therewith form another rigid system, distractors intended to interconnect said rigid systems, hinge joint fastenings of said distractors, situated at the two ends of the wire spoke of the supporting stirrup, the position of the axis of said hinge joint fastenings determining that of the axis of rotation of the apparatus, and a regulator of the position of the apparatus' axis of rotation, including a means for rotating the fulcrum of the hinge joint fastening of the distractors along a circumference relative to the axis of the wire spoke of said supporting stirrup, as well as a means for moving the fulcrums of the hinge joints along the distractors interconnecting said supporting and rotatable stirrups.

4,100,920
METHOD AND APPARATUS FOR TRANSFERRING MICROORGANISMS THROUGH THE SKIN BARRIER

Jacqueline Marie George Juliette Le Goaster, 6, rue Raffet, 75016 Paris, Seine, France

Filed Aug. 19, 1976, Ser. No. 715,708
Claims priority, application France, Sep. 2, 1975, 75 26888; Apr. 22, 1976, 76 11924
Int. Cl.[2] A61N *1/30*
U.S. Cl. 128—172.1 **18 Claims**

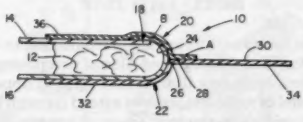


9. A system for transferring microorganisms through the skin barrier comprising a pair of electrodes, a source of continuous current, an electrical connection between said source and said electrodes, a nutrient solution containing the said microorganisms, the said nutrient solution being adapted to be applied to the skin barrier, and the said electrodes being adapted to be arranged against the skin barrier, at least one of the electrodes being adapted to be arranged upon the part of the skin barrier to which is applied the nutrient solution containing the said microorganisms during use, said at least one electrode containing said solution.

4,100,921
DIAPER FASTENER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,375
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **30 Claims**



1. In combination with a diaper having an inner surface, an outer surface, and a lateral edge, a fastener for securing said diaper to the diaper wearer comprising first and second pieces of tape each having a first surface having an adhesive disposed thereon and a second surface which is free of adhesive, a major portion of said first tape first surface being adhesively secured to said inner surface of said diaper for securing the first tape thereto and and a minor portion of said first tape first surface extending beyond said lateral edge of said diaper when said diaper is placed on the wearer and being adhesively secured to a first minor portion of said second tape first surface, and a second portion of said second tape first surface being releasably secured to said first tape second surface prior to placement of said diaper on said diaper wearer whereby, when said

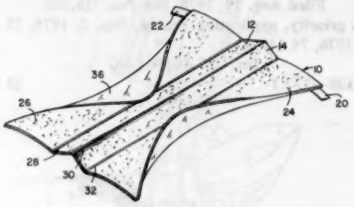
diaper is to be placed on the wearer said second portion may be peeled from said first tape second surface and secured to another portion of said diaper.

4,100,922

DISPOSABLE DIAPER

John Michael Hernandez, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 9, 1975, Ser. No. 594,345
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **1 Claim**



1. A disposable diaper substantially rectangular in shape and having only four longitudinal sections, said diaper comprising in order, a water pervious layer, an absorbent pad layer and a water impervious layer, two of said sections being a pair of abutting, substantially centrally located longitudinal panels defined by three substantially parallel longitudinal folds extending the length of said diaper, said panels being of approximately equal width and the combined width of said panels being from one-fourth to one-half the width of said diaper, a flap portion adjacent each of said panels, said adhesive means on each of said panels approximately centrally located longitudinally thereof, said adhesive means being deposits of adhesive extending less than the width of each of said panels, said flap portions overlying said deposits of adhesive and only partially overlying said water pervious layer and secured thereto by said deposits of adhesive to form an hour glass configuration, with the corners of the diaper lying flat, adhesive tab means attached to said water impervious layer at least one corner of said diaper, said water impervious layer comprising a thin, flexible plastic material of polyethylene, polypropylene or polyvinyl chloride, said absorbent pad layer being cellulose wadding, said water pervious layer being hydrophobic paper.

4,100,923

EXTRA-AMNIOTIC ADMINISTRATION DEVICE

Edward M. Southern, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 16, 1976, Ser. No. 751,096
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **5 Claims**

1. A device for administering liquid medication to the extra-amniotic space of an impregnated uterus, comprising:

an elongated, resiliently flexible tube open at opposite ends thereof and of sufficient lenth to extend through the cervix and into said extra-amniotic space of a uterus at one end and into the birth canal at the other end;

first conduit means connected to the other end of said tube means and extendable through and beyond the birth canal for permitting a liquid medication to be supplied through said tube into said extra-amniotic space;

first and second flanges secured to said tube and being spaced from each other along said tube by a distance approximately equal to the distance between the uterus and the birth canal at the opposite ends of the cervix;

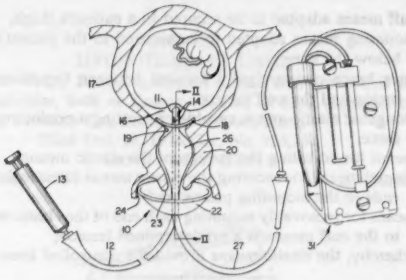
said first flange being positionable within the extra-amniotic space of said impregnated uterus directly adjacent the internal os of the cervix for preventing accidental ejection of the tube from the uterus;

said second flange being cup-shaped and positionable within the birth canal closely adjacent the external os of the cervix for preventing accidental ascension of the tube relative to the uterus, said cup-shaped second flange having a central portion thereof disposed closely adjacent but slightly spaced from the external os to collect any liquid medication which seeps back through the cervix, the cup-shaped second flange having a rim which is snugly engageable with the wall of the birth canal surrounding the external os;

a resiliently flexible, inflatable, substantially cylindrical member disposed between said flanges and connected to said tube to define a fluid-tight annular chamber surrounding said tube, said member when inflated snugly engaging the wall of the cervix; and

second conduit means connected to said chamber within said inflatable member and extendable therefrom through and beyond said birth canal for supplying an inflating fluid to said chamber.

3. A method for delivering a liquid medication into the extra-amniotic space of an impregnated uterus, comprising the steps of:



providing an elongated open-ended tube having a first flange thereon adjacent one end thereof and a second cup-shaped flange which opens toward the first flange and is spaced therefrom along said tube by a preselected distance which is slightly greater than the length of the cervix;

inserting the tube through the birth canal and the cervix so that said one end thereof extends into said extra-amniotic space;

positioning said tube so that said first flange is disposed within the extra-amniotic space closely adjacent the internal os of the cervix for preventing accidental ejection of the tube and said second flange is disposed closely adjacent but slightly spaced from the external os of the cervix for preventing accidental insertion of the tube;

causing a supply of said medication to flow through said tube and into said extra-amniotic space;

preventing the escape of said medication from said extra-amniotic space into said birth canal by collecting any seepage of medication through the cervix within said cup-shaped second flange; and

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4,100,924

SHOULDER STRAP

Frieda M. Rosenberg, 145 Crescent Beach Dr., Burlington, Vt. 05401

Filed Jun. 16, 1977, Ser. No. 807,119
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—510 **10 Claims**

1. A shoulder strap for extending over a person's shoulder to support a load from the person's shoulder, said strap comprising:

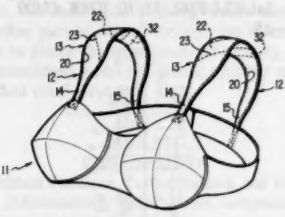
a flexible elongated main strap portion having end portions, each of which is secured to the load;

a widened flexible intermediate portion having front and rear ends;

a first single pocket extending diagonally to the length of the strap across the intermediate portion adjacent to the front end of the intermediate portion;

a single stay member disposed within said first pocket;

a second single pocket having a width less than the width of the first pocket and extending at an angle to the length of the strap across the intermediate portion adjacent to the rear end of the intermediate portion; and



a single stay member disposed within said second pocket; whereby:

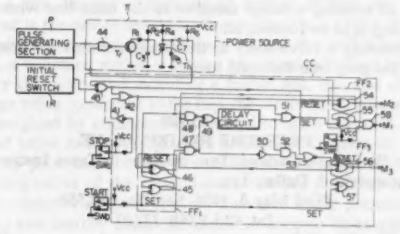
said first and second stay members substantially bridge the scapula and clavicle of the person's shoulder without interfering with arterial or venous drainage of the shoulder.

4,100,925

COIN JAMMING DETECTING DEVICE

Motoaki Fukunaga, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Dec. 17, 1976, Ser. No. 751,708
Claims priority, application Japan, Dec. 26, 1975, 50/156914
Int. Cl.[2] G07D *3/00*
U.S. Cl. 133—3 F **2 Claims**



1. A coin jamming detecting device in an apparatus comprising a coin receiving means for receiving coins from outside and a coin moving means for moving coins delivered thereto by the coin receiving means into a coin storing section, which device comprises:

a pulse generating means associated with said coin moving means for generating pulses at time intervals proportional to the time interval of an operation cycle of said coin moving means;

a timer means operatively connected to said pulse generating means, for producing an abnormal signal when the time interval between said pulses generated by said pulse generating means becomes longer than a predetermined period of time; and

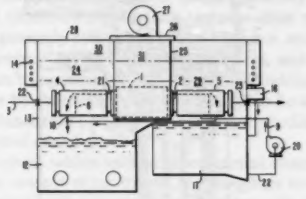
a drive control means operatively connected to said timer means, for stopping the operations of said coin receiving means and said coin moving means upon reception of said abnormal signal.

4,100,926

APPARATUS FOR ULTRASONIC CLEANING WITH LIQUID SOLVENT IN A BLANKET OF VAPOR

Richard C. Heim, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 22, 1976, Ser. No. 725,214
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—64 R **3 Claims**



1. Apparatus for ultrasonic cleaning with liquid solvent comprising:

an enclosure;

means in a first region of said enclosure containing liquid solvent for generating vapor from said liquid solvent;

means in a second region of said enclosure for condensing said vapor, said second region means being spaced from said first region means and said first and second region means defining therebetween a third region of said enclosure occupied by saturated vapor;

means in said third region containing liquid solvent;

transducer means mounted in said third region for applying ultrasonic energy to said third region liquid solvent;

an elongated workpiece passed through said enclosure in said third region thereof, and passed through said third region liquid solvent for conducting ultrasonic cleaning of said workpiece by said transducer means; and

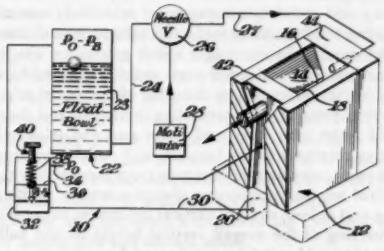
means provided in said third region for insulating said transducer means from said vapor and said liquid solvent.

4,100,927

FLUID FLOW REGULATION

Casper W. Barnes, Jr., Newport Beach, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 485,518, Jul. 3, 1974, Pat. No. 3,987,132.
This application Jun. 18, 1976, Ser. No. 697,419
Int. Cl.[2] G05D *7/01*
U.S. Cl. 137—9 **1 Claim**



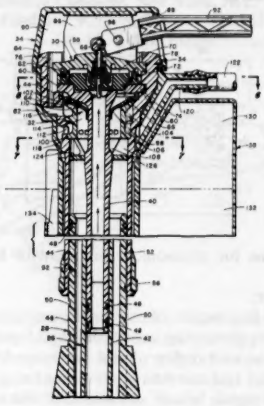
1. A method of varying the mass flow rate of fluid across a turbulent-flow valve in direct proportion to changes in pressure differential across the valve comprising the steps of delivering fluid under pressure to a turbulent-flow valve, and applying a fixed pressure bias to the fluid upstream of the valve, the fixed pressure bias being of such a magnitude that the mass flow rate of fluid through the valve varies directly with variations in the pressure differential across the valve when these variations are within a selected pressure range.

4,100,928

BALL COCK CONSTRUCTION FOR CONTROLLING THE LEVEL OF LIQUIDS SUCH AS WATER IN TANKS

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631

Filed Jul. 19, 1976, Ser. No. 706,479
Int. Cl.[2] F16L *55/00*; F16K *31/34*
U.S. Cl. 137—15 **17 Claims**



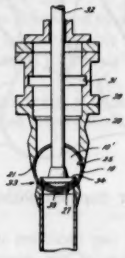
7. In a method of forming a vertically adjustable ball cock for controlling the level of liquids such as water in a tank, the ball cock being of the type having a vertical inlet tube downwardly securable to a tank bottom wall in communication with a water supply and upwardly secured to a float controlled valve, a vertical outlet tube telescoping said inlet tube spaced radially outwardly therefrom for the flow of water downwardly therebetween, said outlet tube being downwardly securable to said tank bottom wall and upwardly secured to said valve, and a water outlet opening communicating into said tank at a lower extremity of said outlet tube; the steps of: forming and positioning each of said inlet and outlet tubes having vertically end telescoping upper and lower parts with said inlet parts vertically communicating and said outlet parts vertically communicating during varying amounts of said vertical end telescoping; during said forming and positioning, rigidly generally radially interengaging said upper and lower parts of said outlet tube normally positively resisting at least straight vertical movement between said inlet and outlet tube upper and lower parts; during said formation of said radial interengagement of said outlet tube upper and lower parts, forming said radial interengagement selectively operable for increasing and decreasing said outlet tube upper and lower part end telescoping by forming a spiral groove on one of said outlet tube upper and lower parts radially engaged by a rigid radial projection formed on the other of said outlet tube upper and lower parts thereby permitting increasing and decreasing of said outlet tube upper and lower part end telescoping by selective relative rotation between said outlet tube upper and lower parts carrying said inlet tube parts therewith with resultant final selected positioning always normally positively resisting said at least straight vertical movement to permit selective varying of the overall vertical height of said ball cock; terminating said spiral groove spaced from its tube part telescoping end termination normally preventing vertical separation of said outlet tube upper and lower parts during said relative rotation between said tube upper and lower parts by retaining said engagement of said radial projection with said spiral groove; during said forming of said groove and projection radial interengagement selectively operable, forming said groove and projection radial interengagement selectively operable at any adjusted vertical height of said ball cock for permitting selective complete radial separation of said groove and projection radial interengagement to permit complete vertical separation between said inlet and outlet tube upper parts and said inlet and outlet tube lower parts.

4,100,929

ACROSS THE LINE PLUGGING APPARATUS AND METHOD

George W. Harrison, Houston, Tex., assignor to Team, Inc., Alvin, Tex.

Filed Aug. 2, 1976, Ser. No. 710,585
Int. Cl.[2] F16L *55/10*; F16K *43/00*
U.S. Cl. 137—15 **8 Claims**



1. A method of sealing across a main line to plug a branch line having an opening therein communicating with the interior of the main line comprising the steps of:

(a) forming an opening in the main line across from the opening between the branch line and the main line;

(b) inserting a plug through the formed opening and into the main line;

(c) forming a sealing engagement between the plug and the circumferential periphery of the main line around the opening communicating the branch line with the main line; and

(d) inserting at least a portion of the plug inwardly into the opening communicating the branch line with the main line.

2. The method of sealing set forth in claim 1, including the step of welding a flange member to the main line where the opening is to be formed; and

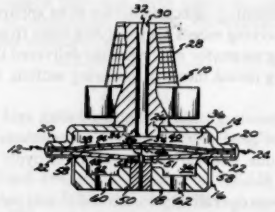
mounting a valve body to the flange member for inserting the plug into the main line.

4,100,930

PRESSURE RELIEF VALVE

John W. Orcutt, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1976, Ser. No. 682,558
Int. Cl.[2] F16K *17/40*
U.S. Cl. 137—68 R **4 Claims**



1. A pressure responsive relief valve comprising a housing having a chamber to be placed in communication at one side of the chamber with a pressure zone to be monitored, a membrane formed with a dished configuration positioned in the chamber to divide the chamber into a first part at said one chamber side and a second part separated from said first part by the membrane, a disc member of a concave-convex dished configura-

tion generally the same as that of the membrane disposed in the second chamber part nested against and conforming to said membrane with its convex side facing the first chamber part movably supporting the membrane in a first position against the zone of pressure in the first chamber part, the dished member having an aperture therein and being substantially coextensive in area with the membrane and being movable with snap action to an inverted dished configuration in response to the occurrence of a selected pressure level in the first chamber part for permitting the membrane to move to a second position in the chamber, and membrane piercing means mounted in the second chamber part to extend through the dished disc member aperture to pierce the membrane for venting the pressure zone being monitored when the dished member moves to said inverted dished configuration.

4,100,931

FIRE DAMPER

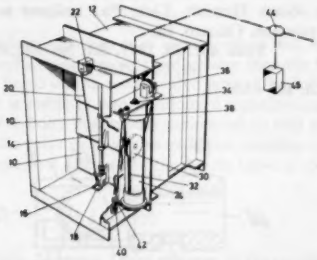
Frederick William Pantland, Tralee, Ireland, and Ernest Francis Pantland, Johannesburg, South Africa, assignors to Leonard Joseph Fisher, Sandton, South Africa

Filed Jul. 12, 1976, Ser. No. 704,599

Claims priority, application South Africa, Jul. 18, 1975, 75/4627

Int. Cl.[2] F16K *17/38*

U.S. Cl. 137—77 **5 Claims**



1. A fire damper comprising an orifice, at least one flap pivoted in the orifice between a first position in which it closed the orifice and a second position in which the orifice is fully open, a winching motor, a motion transmitting linkage operable by the motor and including a fusible link, one end of the linkage being connected to the flap, the motor being adapted to be energized by compressed air fed through a solenoid controlled valve so that energization of the motor causes the flap to open provided that the fusible link is still intact whereas de-energization of the motor causes the flap to close, and a smoke detector adapted to close the valve in the presence of smoke and thereby cause the motor to become de-energized, said smoke detector being further adapted to open the valve in the absence of smoke and thereby cause the motor to become energized.

4,100,932

PIPE BURST SAFETY DEVICE FOR NATURAL GAS PIPE LINES OR THE LIKE

Hermann Schmitz, Haan, Fed. Rep. of Germany, assignor to P.D. Rasspe Soehne, Solingen, Fed. Rep. of Germany

Filed May 28, 1976, Ser. No. 690,877

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541734

Int. Cl.[2] F16K *31/12*

U.S. Cl. 137—488 **5 Claims**

1. In a pipe burst safety device for automatically closing a flow control valve connected in a pipe line for transmitting fluid under pressure, wherein in response to a drop in pressure within the pipe line the flow control valve is operated and closed by a fluid actuator means receiving fluid pressure from the pipe line at a location upstream of the flow control valve, the combination of:

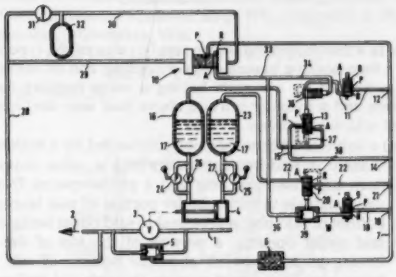
a fluid line connected to the pipe line downstream of the flow control valve and having two parallel branches, one of said branches having a pressure drop transmitting delay means connected therein;

a differential pressure valve connected with said two parallel branches, and comprising:

a housing containing two aligned, spaced, generally cylindrical end chambers disposed on opposite sides of an enlarged, generally cylindrical central chamber, each of said end chambers having an inlet port therein, and said end chambers being joined to said generally cylindrical central chamber by abutment shoulders disposed to lie in parallel planes that extend perpendicular to the longitudinal axis of said central chamber;

a slide received within said enlarged central chamber, and movable toward either of said end chambers into sealing engagement with said abutment shoulders, the inlet port of the second of said end chambers being connected with said one branch, and the inlet port of the first of said end chambers being connected with the other of said branches; and

resilient means arranged to urge said slide to move toward said second end chamber, said slide normally being shifted toward said first end chamber into sealing engagement



with the abutment shoulder there located when said end chambers receive full working pressure from the pipe line, whereby the effective pressure area of said slide presented to said second end chamber is then substantially greater than the effective pressure area presented to said first end chamber; and

means controlled by the movements of said slide for controlling the connection of said fluid actuator means to the pipe line, including a switch valve connected between said pipe line and said fluid actuator means and arranged to be operated by the movements of said slide, said switch valve being arranged to be opened when said slide shifts toward said second chamber in response to a drop in pressure in said pipe line transmitted to said differential valve by said fluid line, said fluid actuator means including:

an acutator unit, including a double acting hydraulic cylinder having first and second inlets;

a pair of pressure actuated, two-position main valves connected respectively with said first and said second inlets of said hydraulic cylinders; and

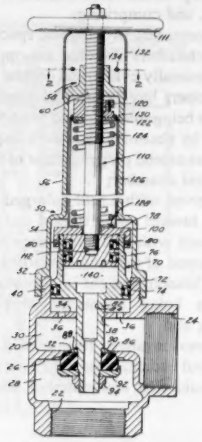
means connecting said switch valve with said main valve, arranged to operate said main valves to close said flow control valve when said differential pressure valve senses a drop in pressure in said pipe line downstream of said flow control valve, said two main valves being connected by pipes to said pipe line upstream of the flow control valve for transmitting pressure to said actuator unit.

4,100,933

FIRE PROTECTION WATER SUPPLY VALVE

John T. Davey, and Lawrence P. Kahn, both of Toledo, Ohio, assignors to Seco Manufacturing, Inc., Toledo, Ohio

Filed Jun. 2, 1975, Ser. No. 582,845
Int. Cl.[2] G05D *16/00*; F16K *31/363*
U.S. Cl. 137—495 4 Claims



1. In a fire protection water supply valve of the type including a base housing having an inlet opening and an outlet opening separated by a septum having a valve opening and seat therein and a cylinder portion above said seat, that improvement which comprises:

(a) a valve and piston assembly connected by a hollow shaft slidable in said housing comprising a valve movable to open and close said seat and a piston spaced from said valve slidable in said cylinder portion of said housing, the bottom of said piston proximal to said outlet being open to said outlet opening, a portion of the top of the piston having an area smaller than the bottom of said piston being open to said inlet opening through said hollow shaft,

(b) spring means mechanically biasing said piston to an open position,

(c) means including a control element manually selectively operable in two directions from without said base housing disposed to mechanically shift said piston to move said valve to a closed position to decommission said piston and to move said valve to an open position, and

(d) a top housing secured to said base housing,

(e) said piston being hollow to provide an enclosed chamber therewithin, said control element being movable in said chamber, and said last means comprises a shaft movable axially in said top housing to control the position of said control element in said chamber and the position of said valve.

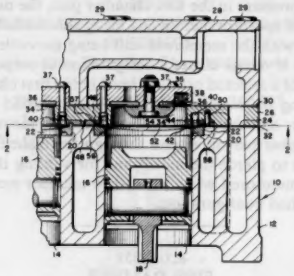
4,100,934

RECIPROCATING REFRIGERANT COMPRESSOR VALVE ARRANGEMENT

Arthur L. Butterworth, and Joseph F. Niedzwiecki, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed May 16, 1977, Ser. No. 797,155
Int. Cl.[2] F16K *15/14*, *51/00*
U.S. Cl. 137—512 18 Claims

1. In a compressor apparatus the combination of: a cylinder body having a generally planar face and a cylinder defined in said cylinder body opening at one end thereof to said generally planar face, a valve plate overlying said face and having inlet and discharge passageways therein for conveying a compressible fluid to and from said cylinder, said valve plate including an annular valve seat at one end of one of said passageways; an annular valve disposed in face-to-face abutting relationship with said valve seat; a valve stop in said cylinder body below



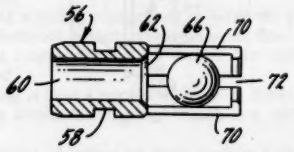
said valve plate for limiting the axial movement of said valve in its open position; said valve stop including a flange extending upwardly beyond said face; said valve plate having a recess at said valve seat receiving said flange.

4,100,935

CHECK VALVE FOR HEAT PUMP SYSTEMS

James Ranck Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 28, 1977, Ser. No. 792,070
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—533.11 5 Claims



1. A check valve comprising a generally cylindrical valve body adapted to be held within a tubular sleeve, said valve body having a central fluid passage terminating with a valve seat on the outlet side thereof; a moveable ball member adapted to engage said valve seat and prevent fluid flow when seated; means defining a cage for said ball member including a plurality of arms extending axially with a stop portion to arrest further movement of said ball member, the cross-sectional area of said arms blocking flow around said ball member to the extent that the flow area past the ball, when the valve is in its open position, is between 15–35% of the area across said central fluid passage.

4,100,936

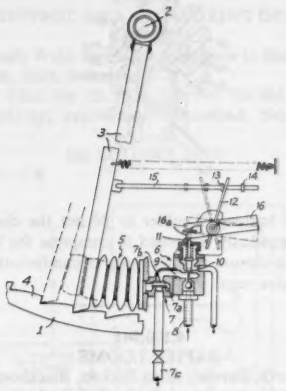
THREE-WAY HYDRAULIC VALVE

Jean-Claude Turion, Paulhan, France, assignor to Irrifrance, Paulhan, France

Filed May 17, 1976, Ser. No. 686,810
Claims priority, application France, May 30, 1975, 75 17354
Int. Cl.[2] F15B *13/04*; F16K *11/14*
U.S. Cl. 137—596.2 3 Claims

1. A three way hydraulic valve intended for distributing a liquid containing impurities, comprising: a housing having first inlet way formed therein for said liquid and second and third liquid outlet ways formed therein, said housing having a valve seat formed therein located between said first and second ways and a valve seat located between said second and third ways, a ball valve located in said first way for engagement with said seat between said first and second ways solely under the influ-

ence of the pressure of said liquid in said first inlet way; a conical needle valve in said housing; spring means for biasing said needle valve on said seat located between said second and third ways, said seat for the needle valve having an orifice of a diameter smaller than that of the orifice of the seat of said ball valve, and means for adjusting the compression of said spring so that the force it exerts is lower than the thrust necessary for



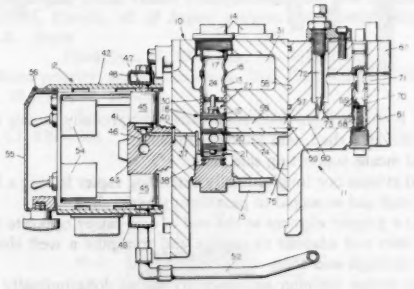
opening the ball valve when it is maintained closed by the pressure of liquid in said first way and greater than the thrust exerted by the liquid on the needle valve when it is closed, so that said valve is stable in two positions; a maneuvering rod outside the valve body operatively connected to said needle valve, said needle valve including an extension abutting on said ball and maintaining it open when the needle valve is closed.

4,100,937

VALVE BLOCK

James D. Mallory, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 16, 1976, Ser. No. 714,878
Int. Cl.[2] F16K *11/10*
U.S. Cl. 137—596.16 **16 Claims**



1. A valve block for an individual section glassware forming machine comprising:

a first casting having a plurality of generally vertically positioned poppet valves, said poppet valves being arranged in two adjacent rows;

individual pilot air inlet passages extending from one wall of said casting to each of said plurality of poppet valves;

a second casting having a pilot air manifold extending parallel to said one wall;

a plurality of passages from said manifold communicating with the pilot air passages;

a plurality of solenoid operated valves carried by said second casting for connecting and disconnecting said supply of pilot air to said plurality of passages from said manifold;

a third casting connected to the opposite wall of said first casting;

a plurality of openings in said third casting communicating with a plurality of openings in said first casting;

a supply of operating air in said first casting in a manifold chamber extending the length of said first casting;

a plurality of passages extending through said third casting adapted to communicate with the "kiss block" of an IS machine;

an exhaust header extending the length of said first casting; and

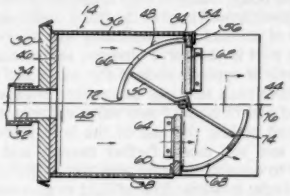
an exhaust manifold in said third casting having an opening in the wall thereof in communication with said exhaust header.

4,100,938

FLOW CONTROL UNIT FOR AIR DISTRIBUTION SYSTEM

Konstantins Dravnieks, Madison; Rueben Zahler, Verona, and Gordon C. Sylvester, Madison, all of Wis., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 16, 1976, Ser. No. 751,439
Int. Cl.[2] F16K *47/14*
U.S. Cl. 137—625.31 **8 Claims**



1. A control unit for an air distribution system comprising

a housing having an inlet, an outlet and a flow passage extending between said inlet and said outlet; and

a flow control assembly disposed in said housing for controlling the volume of air flowing through said flow passage including

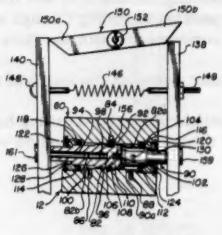
a damper mounted for pivotal movement, about an axis extending transversely for said flow passage, between an open position and a closed position to shut off flow through said flow passage, said damper having opposed transversely extending outer edges,

first and second transversely extending perforate members including a plurality of relatively small orifices and disposed in generally surrounding relationship and in close proximity to the arcuate travel path of said damper outer edges, said first and second perforate members each having a transversely extending open edge and being arranged such that, during an initial portion of damper travel from the closed position towards the open position, said damper cooperates with said perforate members to cause substantially all of the air flowing from said inlet to said outlet to pass through said orifices and such that, during a subsequent portion of damper travel toward the fully open position, an open flow passage exists between said damper and said open edges.

4,100,939
TIME CYCLE ACTUATOR

Robert E. Meynig, 2609 Sheraton, Denton, Tex. 76201

Division of Ser. No. 632,341, Nov. 17, 1975, Pat. No. 3,993,098.
This application Jul. 30, 1976, Ser. No. 710,172
Int. Cl.[2] G05D *7/00*
U.S. Cl. 137—627.5 5 Claims



1. A valve comprising a body having a bore formed therein, said bore communicating with an inlet; and said bore further having an annular groove formed in the middle thereof; a valve element having an annular groove formed about the periphery of the valve element dividing the valve element into two equal portions, said valve element further having a bore formed centrally therethrough and a pair of ports formed on opposite sides of the annular groove in the valve element communicating with the bore of the body; a partition to divide said bore in said valve element in half; an O-ring secured in said annular groove on the valve element and the groove formed in the bore of the body such that the inlet is sealed when the O-ring is centrally aligned; a pair of O-rings secured about each end of the valve elements to seal between the valve element and the bore of the body; means to limit longitudinal movement of said valve element in said bore of the body; outlet means formed on each side of the inlet communicating with the bore of the body and each port in the valve element; seal means comprising a pair of seals at opposite ends of the valve; and means to alternately move each said seal means into engagement with the associated end of bore of said valve element, said seal means closing and sealing the end of the bore through said valve element, said seal means further moving said valve element inwardly to connect the inlet with one of the outlet means and open said inlet to allow flow of fluid to the outlet and moving the seal means on the opposite end away from the end of said valve element, to open and to vent the opposite end of the valve element and opposite outlet means to the atmosphere.

4,100,940
TRICKLE EMITTER FOR SUBTERRANEAN IRRIGATION

Robert Wayne Spears, 13672 Wheeler Ave., Sylmar, Calif. 91342

Continuation of Ser. No. 233,156, Mar. 9, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,641
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—877 8 Claims

1. In an emitter for dispensing water at a minute rate from a pipe, for subterranean irrigation:

means on the top of said pipe defining an open top valve cage;

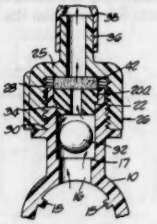
a closure screw threadedly engaging the top of said cage and having a tubular nipple extending upwardly and communicating with the interior of said cage;

a flexible hose of relatively small diameter telescopically connected to said nipple;

a valve member in said cage free to rise to an upper valve seat in the cage in response to initial water flow through the cage, there being a minute passage by-passing the seat for releasing water from the cage when the valve member is in the seat, said valve seat being an elastomer bushing;

the lower portion of said bushing being of reduced diameter to define a downwardly facing outer circumferential shoulder;

the upper portion of the valve cage being enlarged to define an upwardly facing inner circumferential shoulder to mate

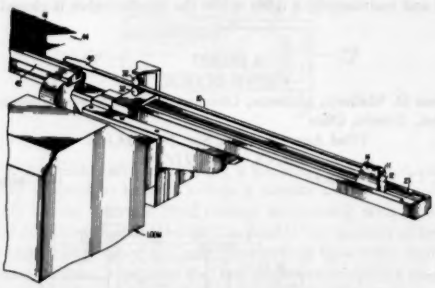


with the bushing shoulder to permit the closure to be screw threadedly tightened to compress the bushing between the closure and the inner circumferential shoulder of the valve cage.

4,100,941
RAPIER LOOMS

David Ainsworth, Darwen; Allan Beckett, Blackburn, and Cyril Millward Atkinson, Barrowford, all of England, assignors to Northrop Weaving Machinery Limited, England

Filed Jun. 4, 1976, Ser. No. 692,714
Claims priority, application United Kingdom, May 6, 1975, 24225/75
Int. Cl.[2] D03D *47/12*
U.S. Cl. 139—449 11 Claims



1. A rapier loom wherein a rapier reciprocally moves into and out of a shed, said loom comprising:

(a) means supporting said shed,

(b) at least one longitudinally extending rapier having a butt end and arranged to pass through said shed,

(c) a gripper element at the end of said rapier opposite said butt end adapted to engage and transport a weft thread through said shed,

(d) means defining an upwardly facing longitudinally extending slide channel extending below said rapier and shed and outwardly from one side of said shed and parallel to said rapier,

(e) a drive rack slidably mounted in said slide channel below said rapier and shed and including a plurality of teeth facing downwardly,

(f) drive means including a drive gear arranged below said shed and slide channel and projecting upwardly into said slide channel to mesh with said teeth and reciprocate said drive rack and means for rotating said drive gear back and forth, and

(g) means securing together said drive rack adjacent one end thereof and said rapier adjacent said butt end in spaced

relationship with said drive rack and rapier extending substantially parallel to each other in the same direction from said securing means such that when said drive rack is reciprocated below said shed said rapier is simultaneously reciprocated into and out of said shed to transport said weft thread through said shed.

4,100,942

DRIVE, CONTROL AND MONITORING DEVICE FOR LOOMS

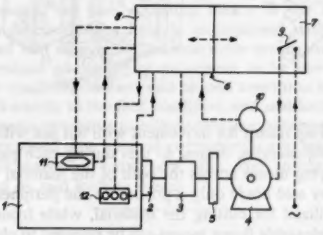
Rudolf Tschudi, Wald, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Sep. 23, 1976, Ser. No. 726,004

Claims priority, application Switzerland, Sep. 30, 1975, 12645/75

Int. Cl.[2] D03D *51/00*

U.S. Cl. 139—1 R **4 Claims**



1. A drive, control, and monitoring device for looms comprising a drive motor connected to the power line, a flywheel operatively connected with the drive motor, an electromagnetic brake and clutch unit operatively positioned between the flywheel and the crankshaft of the loom, means for controlling and monitoring the weaving process, and means for producing additional source of current to the control and monitoring means to provide electrical energy for the controling of the clutch part of the electromagnetic brake and clutch unit and for the monitoring of the weaving process.

4,100,943

SHUTTLE FOR RIBBON LOOMS

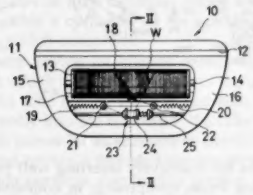
Seiko Terada, Uozu; Hissei Nishiyama, Fuchu, and Masaatsu Oofusa, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Japan

Filed Dec. 17, 1976, Ser. No. 751,697

Claims priority, application Japan, Dec. 29, 1975, 51/178457; Dec. 29, 1975, 51/178458

Int. Cl.[2] D03D *35/00*; D03J *5/24*

U.S. Cl. 139—201 **2 Claims**



1. A shuttle for a ribbon loom comprising:

(a) a housing;

(b) a bobbin supported in said housing for carrying a thread to be wound therearound and for rotation about a given axis;

(c) a tensioning means in said housing for keeping the thread under constant tension while being unwound from said bobbin and running, said tensioning means including a roller for adjusting the tension of the thread and supported on said housing for rotation about an axis located forward of the rotation axis of said bobbin, said roller being disposed to receive thread unwound from the bobbin and to pay out such thread as received in a backward direction; and

(d) a thread discharge eyelet supported on said housing for discharging the thread therethrough out of said housing, said thread discharge eyelet being located at a predetermined distance from the plane defined by the axes of said bobbin and roller, in a position forward of the bobbin rotation axis and backward from the roller rotation axis.

4,100,944

METHOD AND APPARATUS FOR TRANSFERRING THE WEFT

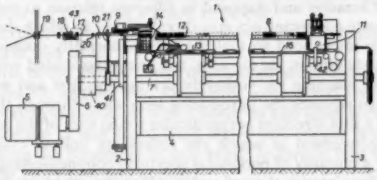
Cesare Germani, Como, Italy, assignor to Omita S.p.A., Italy

Filed Sep. 7, 1976, Ser. No. 721,312

Claims priority, application Switzerland, Sep. 19, 1975, 12184/75

Int. Cl.[2] D03D *47/24*

U.S. Cl. 139—439 **6 Claims**



1. A method for transferring the cut end of a weft to a second shuttle in a loom with sliding shuttles, each of said shuttles having a clamp to engage the weft, the weft having been introduced into the shed by means of a first shuttle and subsequently cut adjacent the shed on the intake side thereof, said loom further including a shuttle supply drum with a plurality of guide slots adapted to carry said shuttles into shooting position, said weft extending from a supply bobbin through a storage lever to the intake side of said drum and through one of said guide slots to a point adjacent the intake side of the shed, said method comprising the steps of:

rotating said drum to position said second shuttle in shooting position;

frictionally engaging that portion of the weft extending through the first guide slot from which said first shuttle was shot;

retracting the weft, by moving said storage lever, through said first guide slot to a point whereby the cut end of the weft remains in said first guide slot adjacent the intake side of said drum;

holding the weft adjacent the cut end thereof against the inlet face of said supply drum adjacent the clamp of said second shuttle;

opening the shuttle clamp in said second shuttle;

positively laterally drawing a portion of the weft adjacent the cut end thereof into said second shuttle clamp by means of a guide hook; and

closing said second shuttle clamp thereby securing the cut end of the weft therein.

4,100,945
APPARATUS FOR WITHDRAWING LENO WASTE IN WEAVING MACHINES

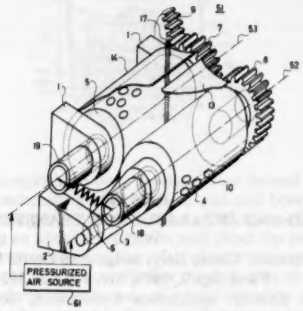
Josef Resch, Rychnov nad Kneznou; Jan Matuska, and Jindrich Trejtnar, both of Tyniste nad Orlici, all of Czechoslovakia, assignors to Elitex Koncern textilního strojirenstvi, Liberec, Czechoslovakia

Filed Jun. 28, 1976, Ser. No. 700,402

Claims priority, application Czechoslovakia, Aug. 25, 1975, 5775-75

Int. Cl.[2] D03D *49/00*

U.S. Cl. 139—291 C **1 Claim**



1. In an apparatus for withdrawing leno waste in a weaving machine, comprising first and second rollers having parallel axes of rotation and disposed in adjacent relation to define a leno waste-advancing nip area therebetween to which the leno waste is introduced so that the rollers normally contact the leno waste only in the nip area, and means associated with the weaving machine for positively driving the first and second rollers to advance the introducing leno waste through the nip area in a first direction perpendicular to the axes of the rollers, the improvement in which the rollers are hollow cylinders having a plurality of peripheral apertures communicating with the hollow interior thereof and in which the apparatus further comprises means associated with each cylinder for introducing a pressurized gas axially into the interior of the respective cylinders to exit from the associated peripheral apertures thereof, whereby portions of the leno waste tending to adhere to a section of each roller as such section has passed through the nip area will be propelled away from the section, the apparatus further comprising a contoured housing surrounding the first and second cylinders and extending in the first direction, the housing having a relatively wide, convex central portion disposed radially outwardly from the periphery of the respective cylinders and a pair of axially opposed, relatively narrow inlet and outlet end portions individually surrounding the path of advance of the leno waste upstream and downstream, respectively, of the central portion, whereby pressurized gas exiting from the peripheral apertures of the first and second cylinders within the central portion of the housing is propelled symmetrically and axially outward through the inlet and outlet end ports of the housing to entrain and tension the leno waste advancing through the housing.

4,100,946
DEVICE FOR CUTTING VELVET BANDS ON LAPPET LOOMS

Marco Limonta, Via A. di Savoia, 9, I-20049 Concorezzo, (Milan), Italy

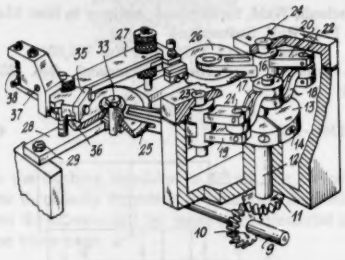
Filed Oct. 7, 1976, Ser. No. 730,461

Claims priority, application Italy, Oct. 14, 1975, 2931 A/75

Int. Cl.[2] D03D *39/18, 39/24*

U.S. Cl. 139—291 C **8 Claims**

1. In a device for cutting a material such as the pile of a double velvet band during movement of the latter along a predetermined path, blade-carrying means and support means supporting said blade-carrying means for movement back and forth across the path of movement of the material which is to be cut, drive means operatively connected with said blade-carrying means for moving the same with respect to said support means back and forth across said path, a circular cutting blade having a circular peripheral cutting edge, said blade being carried by said blade-carrying means for cutting the material, and releasable fixing means releasably fixing said blade to said



blade-carrying means for movement with but not with respect to said blade-carrying means, so that during each pass of the blade-carrying means across the path of the material which is to be cut by said blade only a portion of the periphery of the latter is utilized for cutting the material, while from time to time said releasable fixing means can be released to change the angular position of said blade with respect to said blade-carrying means, so as to bring an unworn portion of the periphery of the blade into an operative position.

4,100,947
APPARATUS FOR SELECTIVELY INSERTING WEFT YARNS INTO THE SHED IN A WEAVING LOOM

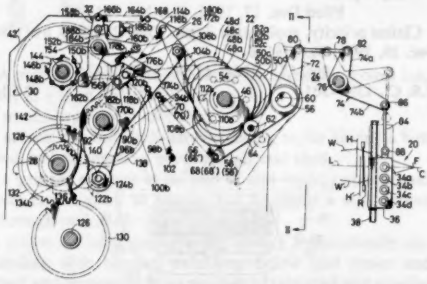
Yukio Mizuno, Kodaira, Japan, assignor to Nissan Motor Company, Limited

Filed Oct. 1, 1976, Ser. No. 728,879

Claims priority, application Japan, Oct. 5, 1975, 50-120035; Dec. 2, 1975, 50-144098

Int. Cl.[2] D03D *47/38*

U.S. Cl. 139—453 **19 Claims**



1. An apparatus for selectively inserting weft yarns into the shed in a weaving loom, comprising, in combination, a weft insertion unit including a plurality of weft shooting members each movable into a position aligned with said shed, weft selector cam means having a plurality of conditions respectively operative to hold said weft shooting members in alignment with said shed, a link mechanism operatively connecting said cam means to said weft insertion unit for moving selected one of said weft shooting nozzles into the position aligned with said shed when said cam means is actuated from one of said conditions into another, cam actuating means operative to

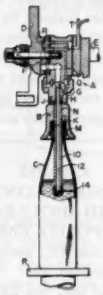
drive said cam means between said conditions thereof in each cycle of operation of the loom, intermittent-motion drive means for driving said cam actuating means alternately into first and second conditions engaging said cam means in different positional relationships to the cam means, the cam actuating means being operative to drive said cam means between said conditions thereof when the cam actuating means is driven from said first condition into said second condition and thereafter from the second condition back into the first condition by said intermittent-motion drive means, weft selector signal supply means storing signals representative of a predetermined schedule in accordance with which the weft yarns are to be selectively inserted into said shed, locking means responsive to the signals delivered from said signal supply means for locking said cam actuating means in a condition inoperative to drive said cam means in response to one signal from the signal supply means and releasing the cam actuating means from the inoperative condition in response to another signal from the signal supply means, the cam actuating means in the inoperative condition thereof being held in engagement with said cam means and said intermittent-motion drive means and having a predetermined allowance of movement to be movable from said first condition toward said second condition thereof and then backwardly to the first condition, and said locking means having means operative to release said cam actuating means at a predetermined time interval corresponding to said predetermined allowance of movement after said another signal is impressed on said locking means.

4,100,948

LIQUID FILLING TUBE WITH PROTECTIVE TIP

Alfred A. Abramoska, Jr., Medina, Ohio, assignor to Arthur Products Co., Medina, Ohio

Filed Jan. 19, 1977, Ser. No. 760,685
Int. Cl.[2] B65B *3/04*; B67C *3/02*
U.S. Cl. 141—392 **7 Claims**



1. A filling device for a container filling machine for verticl disposition within a container as the container is being filled with a fluid, which comprises:

a filling tube having an interior axially extending passage through which the fluid may pass as the container is being filled, the tube having a lower end adapted for insertion downwardly into the container, the tube having an upper end with means for attachment to the filling machine, the lower end having a threaded portion with a pair of annular sealing portions, one sealing portion on either side of the threaded portion, each sealing portion comprising two nonparallel sealing surfaces; and

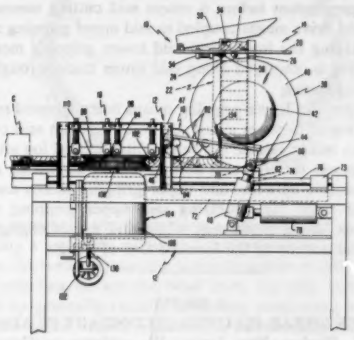
a protective end tip member secured to the lower end of the tube, the tip member formed of a soft low moisture absorbent material, the tip member having a threaded portion which engages the threaded portion of the tube to fixedly secure the tip member to the tube, the tip member having a pair of annular sealing portions, one sealing portion on either side of the internally threaded portion, each sealing portion comprising two nonparallel sealing surfaces, the sealing surfaces corresponding to the sealing surfaces of the tube which abut the sealing surfaces of the tube to form a tight seal, the tip member having a dispensing hole which communicates with the passage in the tube.

4,100,949

WEB FORMING APPARATUS

Clarence F. Carter, Danville, Ill., assignor to Carter Industries, Inc., Danville, Ill.

Filed Dec. 30, 1976, Ser. No. 755,632
Int. Cl.[2] B27C *9/04*, *5/00*
U.S. Cl. 144—3 R **11 Claims**



1. A machine for forming beveled webs comprising:

a table for receiving a board to be cut;

a vertical hopper having an upwardly open inlet end adjacent said table;

a first power driven cutter disposed adjacent said table;

means for shifting said first cutter toward and away from cutting engagement with a board on said table, such that a portion of said board lying above said hopper is severed from the remainder of said board to form a web suitable for entry into said hopper;

support means located beneath said hopper for receiving and supporting said web;

a pair of bevel cutters situated at opposite sides of said support means, each bevel cutter comprising a pair of co-axially arranged, power-driven router heads having inclined cutting faces, forming a cutting angle therebetween, for cutting top and bottom bevels in each end of the web;

pusher means located adjacent the bottom of said hopper; and

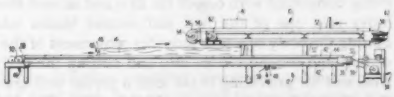
means for driving said pusher means alternately forwardly and rearwardly to displace webs from said hopper and form a row of webs on said support means and to advance the webs an incremental distance toward engagement with said bevel cutters during each forward stroke.

4,100,950

END DOGGING FEEDING DEVICE

Clyde W. Stearns, Box 1016, Kalispell, Mont. 59901

Filed Jan. 26, 1977, Ser. No. 762,939
Int. Cl.[2] B27C *1/12*
U.S. Cl. 144—242 D **12 Claims**



1. A feeding device for continuously feeding logs through a machine cutting center for removing the sides thereof to form a center flitch comprising:

a lower track assembly including a lower track having be-

ginning, central and terminal portions, lower gripping means for engaging the center portion of the rear face of a log disposed in longitudinal alignment with said lower track, and first drive means coupled to aid lower gripping means for conveying said lower gripping means along said lower track from the beginning to the termination thereof;

machine cutting means disposed adjacent the center of said lower track for removing the side portions of a log as said log is conveyed through the central portion of said track;

an upper track assembly disposed over the central and terminal portions of said lower track assembly including an upper track, upper gripping means for engaging the center portion of the forward face of a log engaged by said lower gripping means before it enters said cutting means, and second drive means coupled to said upper gripping means for urging the log against said lower gripping means as said log is conveyed along said lower track through said cutting means;

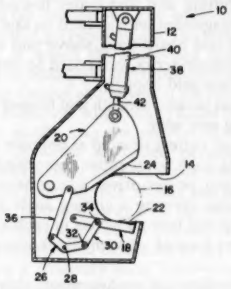
said upper and lower gripping means being adapted to hold said log as it passes along said track through said cutting means and to release the center flitch of said log after the log passes through said cutting means; stabilizing means cooperable between said upper gripping means and said lower track for stabilizing said upper gripping means against lateral movement while said means engages the central portion of the forward face of a log.

4,100,951

TREE SHEAR-PIVOTED SECONDARY BLADE

Robert L. Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1976, Ser. No. 745,739
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—309 AC **7 Claims**



1. Tree cutting apparatus comprising:

frame means;

a first blade movably mounted relative to the frame means;

a second blade movably mounted relative to the frame means, the body of a tree being positionable between the first and second blades;

means operatively connected with one of the first and second blades for moving said one of the first and second blades into the body of a tree; and

means operatively interconnecting the first and second blades for providing that (i) operation of said means operatively connected with one of the first and second blades to move said one of the first and second blades into and cutting the body of a tree provides movement of the other of first and second blades into and cutting the body of a tree, and for providing (ii) at least a partial withdrawal of the other of the first and second blades upon the one of the first and second blades having made a partial cut of the body of a tree, and for providing that (iii) the one of the first and second blades continues cutting of the body of a tree subsequent to the cutting action of the other blade, wherein the means operatively interconnecting the first and second blades comprise link means;

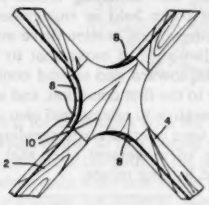
said link means including a first link means pivotally mounted relative to the frame means, a second link means pivotally connected to the first link means and the first blade, and a third link means pivotally connected to the first link means and the second blade.

4,100,952

METHOD FOR JOINING CROSSED SUPPORT MEMBERS TO EACH OTHER

Robert J. Neudorfer, P.O. Box 601, Crosset Hill Rd., Waterbury, Vt. 05676

Filed Jan. 26, 1977, Ser. No. 762,632
Int. Cl.[2] B27F *1/00*; F16M *11/20*
U.S. Cl. 144—314 B **1 Claim**



1. The method of fabricating crossing support members comprising the steps of:

(A) forming a half-lap joint section in each of a pair of said support members;

(B) joining said pair of said support members to each other at said half-lap joint sections whereby said support members intersect each other;

(C) securing triangularly-shaped blocks to said support members in the angles formed by the intersection of said support members with each other;

(D) and applying a facing to the surfaces of said triangularly-shaped blocks and said support members which lie in a common plane with each other, said facing being inlaid in said triangularly-shaped blocks and said support members.

4,100,953

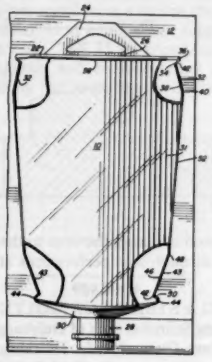
FLEXIBLE COLLAPSIBLE CONTAINER DEFINING RELATIVELY RIGID SHOULDER AND BASE AT OPPOSITE ENDS

Joe A. Miller, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 526,093, Nov. 21, 1974, abandoned, and Ser. No. 669,058, Mar. 22, 1976, which is a division of Ser. No. 526,093,. This application Dec. 16, 1976, Ser. No. 751,613
The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.
Int. Cl.[2] B65D *1/02*
U.S. Cl. 150—0.5 **10 Claims**

1. In a flexible, collapsible container defining a relatively rigid shoulder and neck portion at one end, a relatively rigid base at the other end, and a flexible, tubular wall between said shoulder and base, the improvement comprising, in combination, said container defining, in its original, unstressed condition, first and second pairs of oppositely-disposed gussets defined in said flexible wall and positioned respectively adjacent said shoulder and said base, the first pair of gussets each defining in said wall a recessed, fold line positioned adjacent to and generally parallel with the adjacent edge of said shoulder, the second pair of gussets each defining a recessed, fold line positioned adjacent to and generally parallel with the adjacent edge of said base, each gusset portion also defining in said walls a pair of lines of folding weakness which join together in

angular relationship to define an apex, said lines of weakness extending toward respective ends of their associated recessed,



fold line to define a generally triangular arrangement, whereby, upon collapse of said shoulder, said gussets fold outwardly respectively from the shoulder and base.

4,100,954

DOWEL OR ANCHORING MEANS

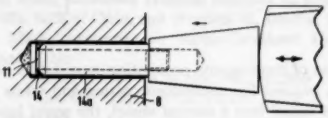
Dieter Müller, Berga Str. 3a, 8136 Percha; Wilhelm Endlich, Mimosenstra. 7, 8 Munich 45, and Siegfried Kügler, Haus Nr. 12, 8041 Fahrenzhausen, all of Germany

Continuation of Ser. No. 583,000, Jun. 2, 1975, abandoned, which is a continuation of Ser. No. 205,158, Dec. 6, 1971, abandoned. This application Oct. 27, 1976, Ser. No. 736,152

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1970, 2059852

Int. Cl.² F16B *39/00*

U.S. Cl. 151—41.7 **11 Claims**



1. An arrangement for anchoring objects to support structures, especially support structures of lightweight building materials, comprising an anchoring element insertable with clearance into an anchoring hole in a support structure and including an elongated member having a straight cylindrical external surface, and an elongated one-piece cylindrical sleeve having a central passage of substantially constant cross section for fittingly receiving said member therein for sliding advancement of said sleeve longitudinally of said member in a path immediately surrounding said external surface of said member; and means for securing said anchoring element in the anchoring hole, essentially consisting of a hardenable substance having two components at least one of which is encapsulated in microcapsules and disposed on said external surface of said member in the form of a layer initially rigidly connected to the latter and located in said path to be stripped from said member by said sleeve during sliding advancement thereof in said path into the anchoring hole with concomitant rupturing of the microcapsules and resulting formation of an intimate mixture of said components which is displaced by said sleeve during said advancement thereof out of said path and into the clearance to subsequently harden therein, said anchoring element being secured in the anchoring hole exclusively by said substance after the latter has hardened.

4,100,955

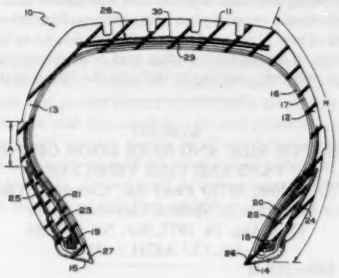
PNEUMATIC TIRE

Marion G. Pottinger, Akron; Edward G. Miller, Jr., Uniontown, and Charles Patrick, Tallmadge, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 8, 1977, Ser. No. 804,668

Int. Cl.² B60C *15/06*

U.S. Cl. 152—362 CS **13 Claims**



1. A pneumatic tire comprising a generally toroidal carcass including a generally cylindrical crown portion and a pair of convex sidewalls terminating in axially spaced beads with each bead including an annular bead core, the said carcass reinforced by generally radially extending reinforcing cords surmounted in the crown region by a substantially inextensible belt formed of at least two plies of parallel cords extending at an angle to the circumferential centerline of the tire, and with the sidewalls and crown portions of the carcass covered by elastomer, characterized in that each sidewall includes first and second annular reinforcing portions formed of cords extending respectively at opposite acute angles relative to the circumference of the base of the adjacent bead with an annular filler of elastomer, generally triangular in cross section, positioned between said portions adjacent the bead core and extending into the tire sidewall to a location intermediate the radially outer edges of the said portions, the end regions of all of said radially extending cords being turned axially outwardly.

4,100,956

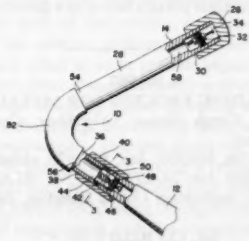
TIRE INFLATION COUPLING APPARATUS

Richard M. Marshall, and Margaret V. Marshall, both of The Renaissance, Apt. 20-06 1360 S. Ocean Blvd., Pompano Beach, Fla. 33062

Filed Mar. 14, 1977, Ser. No. 776,837

Int. Cl.² B60C *29/00*

U.S. Cl. 152—427 **2 Claims**



1. A tire inflation coupling apparatus comprising a first length of rigid pipe, one end of said first pipe having external threads thereon, a tube, said tube having internal threads fixed to the interior surface of the interior wall thereof, a circular plate, said circular plate being disposed within said tube, said circular plate having the lateral surfaces thereof being disposed

substantially at right angles to the longitudinal axis of said tube, said circular plate having at least one opening communicating between said lateral surfaces, said tube threadingly engaged to said external threads on said first pipe, a second length of rigid pipe, one end of said second pipe containing a check valve therein, said check valve having a stem rod affixed thereto, said check valve being biased in a closed position, a length of rubber-like hose, said hose being preformed having the ends thereof at an acute angle to each other, the other end of said first pipe being disposed inserted into one end of said hose, the other end of said second pipe being disposed inserted into the other end of said hose, said hose being flexible so as to respond to a change in air pressure within said hose causing said angle to change, whereby serving to indicate the inflation of the tire.

4,100,957

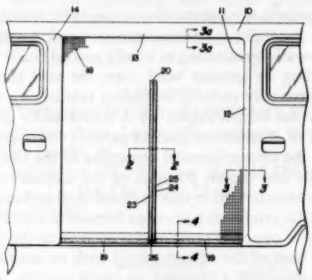
SCREENS FOR SIDE AND REAR DOOR OPENINGS OF VANS AND LIKE VEHICLES

Warren E. Shelton, 15733 Pearl Rd., Cleveland, Ohio 44136, assignor to Warren E. Shelton, Cleveland, Ohio

Filed Aug. 24, 1977, Ser. No. 827,354

Int. Cl.[2] A47H *3/00*

U.S. Cl. 160—368 R **8 Claims**



1. In combination with a side or rear door opening of a van or like vehicle, fastening means secured to the interior of said vehicle adjacent the sides and top of said opening and facing the interior of said vehicle, a screen having marginal portions provided with fastening means secured to said first-named fastening means and facing in a direction exteriorly of said vehicle and removable from said first-named fastening means by a stripping action, a vehicle floor having an edge recessed from said opening, additional fastening means secured to the recessed floor edge adjacent said opening and facing in a direction exteriorly of said vehicle, said screen having a marginal portion provided with fastening means secured to said additional fastening means and removable from said additional fastening means by a stripping action, the fastening means on said last-named marginal portion facing in a direction interiorly of said vehicle.

4,100,958

MOULDING PROCESS FOR METALS

John Workman, Lough House, Greyabbey, County Down, Northern Ireland

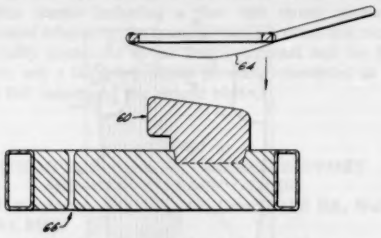
Division of Ser. No. 653,891, Jan. 30, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,625

Claims priority, application United Kingdom, Jan. 31, 1975, 4222/75

Int. Cl.[2] B22D *9/00*

U.S. Cl. 164—7 **3 Claims**

1. A method of locating a core in a mould, which mould comprises a body of binderless moulding material located between films of thin plastics material in a mould box having hollow walls which are perforated at the interface with the body of moulding material, said body of moulding material being held together by the application of sub-atmospheric pressure to the mould box and having a plastics-film-covered surface which is contoured to define a core print, said method comprising the steps of perforating the film of plastics material



at the core print, and adhering the core to the core print by the effect of suction through said perforations at the core print.

4,100,959

TREATING A STREAM OF MOLTEN METAL

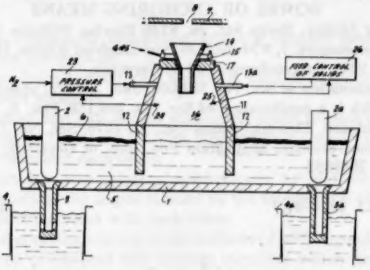
Hans Gruner; Hans Schrewe, both of Duisburg; Gerd Diederich, Angermund; Claus-Dieter Haufe, Duisburg, and Fritz-Peter Pleschiutschnigg, Angermund, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,449

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607735

Int. Cl.[2] B22D *11/10*

U.S. Cl. 164—56 **13 Claims**



1. Method of treating and preventing reoxidation of molten metals in a process for continuous casting and while pouring from a first vessel into a second vessel, the metal leaving the second vessel continuously for continuous casting, wherein a third vessel surrounds the metal as poured from the first vessel, the third vessel defining a reaction chamber being larger than the stream of pouring metal and being closed but for inlets for the poured metal and additives, the steps of measuring the pressure in said third vessel; and

feeding at least one treatment substance into the third vessel at such a rate that the gaseous state of the substance establishes an excess pressure in the third vessel, said feeding maintains an excess pressure in the chamber of sufficient quantity to prevent the influx of ambient air into that vessel and replenishes the substance as it is being drawn into the molten metal as leaving the second vessel.

4,100,960

METHOD AND APPARATUS FOR CASTING METALS

Leonard Watts, North Woodmere, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,478

Int. Cl.[2] B22D *27/04*

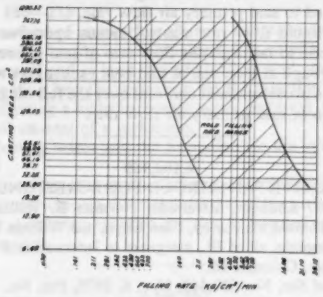
U.S. Cl. 164—119 **12 Claims**

1. A method of casting a metal article in an elongated mold having a cross-sectional area substantially between 25.8 cm^2 and 967.74 cm^2, a thermal conductivity of at least 0.20 $cal/cm^2/cm/^\circ C/sec.$, and a length at least as long as the article

to be cast, said mold having top and bottom portions comprising:

inclining said mold to the vertical;

introducing molten metal from a source through said bottom portion of said mold at a filling rate substantially between 0.239 $kg/cm^2/min.$ and 23.9 $kg/cm^2/min.$, the combination of filling rate and cross-sectional area of the mold being defined by the hatched area of the graph as shown in FIG. 3;



flowing molten metal along said mold by applying a differential pressure across said source and said top portion of said mold;

cooling the mold while regulating the flow of said molten metal therealong to form a solidified casting shell which, during casting, occupies at least 40% of the cross-sectional mold area and has a molten core;

flowing molten metal from said source to extend said casting shell and said molten core toward said top portion of said mold; and

subsequently solidifying said molten core.

4,100,961

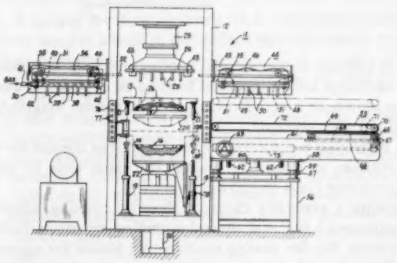
FOUNDRY MOLDING MACHINE

Harold R. Goss, Richmond Heights; Michael A. Krutilla, Chagrin Falls, both of Ohio, and Wendell M. Doolin, Bloomfield Hills, Mich., assignors to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Nov. 18, 1976, Ser. No. 742,860

Int. Cl.[2] B22C *13/12, 15/24, 17/02*

U.S. Cl. 164—180 **16 Claims**



1. A foundry machine, comprising, in combination,

a frame,

first and second mold boxes mounted in said frame for mutual cooperation defining a mold cavity for a mold,

means on said frame to invest mold material into said mold cavity,

curing means on said frame to at least partially cure mold material in said mold cavity to form a mold,

ejection means mounted in the machine and cooperable with said first mold box in a position above said first mold box,

motive means mounted on said frame and connected to relatively move said mold boxes and connected to move said first mold box relative to said ejection means,

transfer means mounted on said frame,

power means connected to one of said transfer means and said first mold box to relatively move said transfer means and said first mold box to an ejection position with said transfer means beneath said first mold box and mold therein,

and control means connected to provide a sequence of operation to actuate said motive means to close said mold boxes and invest mold material into said mold cavity and at least partially cure a mold in said mold cavity, to actuate said motive means to separate said mold boxes, to actuate said power means to relatively move said transfer means and said first mold box to said ejection position, to actuate said motive means to lift said first mold box to eject the mold by said ejection means onto said transfer means and to actuate said power means to transfer the mold away from said first mold box.

4,100,962

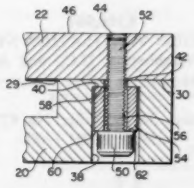
CASTING DIE

Robert B. Housman, Plainville, Mass., assignor to James H. Housman, No. Attleboro, Mass.

Filed Feb. 28, 1977, Ser. No. 773,062

Int. Cl.[2] B22D *11/04*

U.S. Cl. 164—435 **13 Claims**

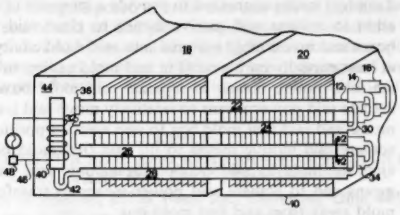


1. A casting die comprising separate upper and lower opposed die segments formed of a material having high temperature resistance and a low coefficient of heat expansion and enclosing a longitudinally orientated open ended casting cavity therebetween, said segments each having body side portions including respective generally flat inner surfaces outwardly disposed to either side of said cavity and in direct face-to-face contact with each other and in part defining a continuous uninterrupted wall of said cavity, and retaining means for maintaining the relative positioning of said segments with respect to each other so as to prevent separation of said surfaces from each other along said cavity wall during the heating of said die, said retaining means including a plurality of inwardly directed openings and headed bolts, each of said openings being longitudinally oriented along the side portions of one of said die segments and having a reduced bore portion formed therein, each of said headed bolts being received in a reduced bore portion and passing through said one die segment and into fixed engagement with the respective body side portion of the other of said segments, a hollow bushing receiving said bolt disposed within each such opening and contacting the opening bottom at one end thereof and the bolt head at the other end thereof, said bushing having a higher coefficient of thermal expansion than said bolt so that upon heating of the die the bushings will expand relatively greater than said bolts thereby progressively tensioning said bolts so as to maintain said die segments in engagement with each other .

4,100,963
HEAT EXCHANGE SYSTEM

Warren H. Dillenbeck, 1100 Edgedale Dr., Salisbury, N.C. 28144

Continuation-in-part of Ser. No. 524,546, Nov. 18, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 642,751
Int. Cl.[2] F24D *11/00, 15/00;* F28D *7/08, 15/00*
U.S. Cl. 165—17 18 Claims

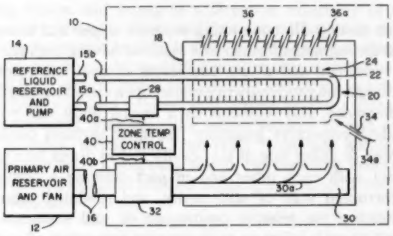


1. In combination with a heat exchange tube of the type having one end in communication with a cooler medium, the other end in communication with a warmer medium, and a working fluid therein with a liquid phase and a vapor phase within the operating temperature range of said tube, an improved control device comprising a reservoir for said working fluid operatively connected to said one end and a heating means operatively associated with said reservoir, said heating means being turned on and off responsive to prescribed temperature conditions, whereby the thermosiphon effect of said heat exchange tube may be modulated by the activation and deactivation of said heating means.

4,100,964
INDUCTION VENTILATION SYSTEM

Dimiter Gorchev, Washington, D.C., and John D. McGraw, Stow, Mass., assignors to Mitco Corporation, Somerville, Mass.

Filed Mar. 31, 1976, Ser. No. 672,125
Int. Cl.[2] B60H *1/00*
U.S. Cl. 165—40 9 Claims



1. An induction ventilation system for one or more zones comprising, in combination:

A. a plurality of heat exchangers, each exchanger being associated with a zone,

B. means for passing a reference liquid from a reference liquid reservoir through said heat exchangers,

C. a primary air injector associated with each heat exchanger, including means for injecting air at an adjustable primary air flow rate from a primary air reservoir, across the associated heat exchanger, and into the associated zone, whereby the temperature of said primary air is convectively modified by said heat exchanger,

D. a secondary air inlet means associated with each heat exchanger, said inlet means being responsive to the flow rate of said injected primary air to induce a secondary air flow at a secondary air flow rate related to said primary air flow rate, said secondary air flow passing from said associated zone, across said associated heat exchanger and returning to said associated zone, whereby the temperature of said secondary air is convectively modified by said heat exchanger, and

E. a zone temperature control including:

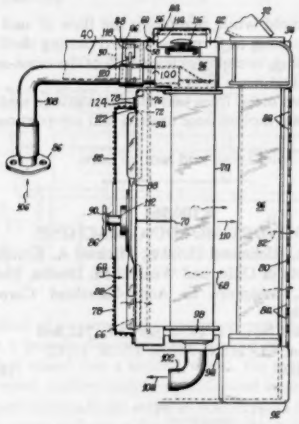
i. selectively operative means associated with each heat exchanger to adjust the flow rate of said primary air into said zone whereby the heat capacity of the primary and secondary air entering said associated zone is related to said primary air flow rate,

ii. a liquid flow rate control means operative in a first mode to maintain the flow rate of said reference liquid through at least one of said heat exchangers to be equal to a predetermined constant over the full range of variation of said primary air flow rate.

4,100,965
AUTOMOTIVE FAN SHROUD FOR SCREENING DEBRIS

Kenneth J. Kolinger, Riverside; Norman E. Williams, Park Ridge; Donald M. Earley, Glen Ellyn, and William R. Golden, Bloomingdale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 629,442, Nov. 6, 1975, Pat. No. 4,018,270. This application Jan. 7, 1977, Ser. No. 757,727
Int. Cl.[2] F28F *19/00*
U.S. Cl. 165—119 6 Claims



1. In a power unit guard and cooling structure incorporating heat exchange means disposed so as to be exposed to a stream of fan-blown-air by confronting same at a point longitudinally along the path thereof,

an improved automotive type radiator-fan shroud for interposition to direct air and at the same time to remove air-borne trash therefrom; and

defining a generally circular, through opening adapted to surround a fan; said shroud including radiator-attachment means, the fan having air-directing blades for moving air through said opening under pressure and longitudinally therefrom under pressure in a path through the plane of said attachment means;

said shroud including therein an air screen across said path which is generally coextensive with the transverse dimensions of the shroud and which is interposed in place therein so that the plane of the air screen is directly between the planes respectively of the attachment means and of the fan opening;

said shroud also including essentially straight side walls, and essentially straight guides affixed thereto for the screen, so as with respect to said longitudinal path to be transversely

disposed similarly to the air screen and to hold the latter in its place.

4,100,966

OIL RECOVERY PROCESS USING AN EMULSION SLUG WITH TAPERED SURFACTANT CONCENTRATION

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,680
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—273 8 Claims

1. A method of recovering oil from a subterranean oil-bearing formation having in communication therewith at least one injection well and at least one production well comprising:

(a) injecting into the formation via the injection well a slug comprising a hydrocarbon-in-water emulsion containing a small amount of a surfactant,

(b) injecting water into the formation via the injection well; and

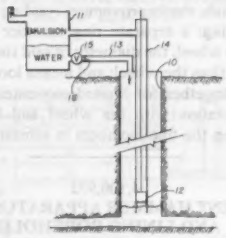
(c) recovering oil from the formation via the said production well and wherein the concentration of the surfactant in the said slug is increased as the slug is injected into the said formation.

4,100,967

SYSTEM FOR DECREASING RESISTANCE TO FLOW OF CRUDE OIL UP FROM A WELL OR THROUGH A PIPELINE

Joseph C. Allen, Bellaire, and Sze-Foo Chien, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 535,896, Dec. 23, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,946
Int. Cl.[2] B67D *5/60*; F17D *1/16*
U.S. Cl. 166—68 5 Claims



1. A system for flowing crude oil at temperatures above 32° F. from deep in a well to the surface with decreased resistance to flow comprising,

(a) means for supplying water down the oil well to an oil-water mixing means,

(b) said mixing means comprising means for mixing only water with the crude oil in the bottom of the well until an emulsion consisting of water and oil passes through the inversion point where the emulsion transforms from a water-in-oil emulsion to a lower viscosity oil-in-water emulsion contains, by volume, about 5 percent to 9 percent oil and 95 percent to 91 percent water, respectively, and

(c) energy means for flowing the water-in-oil emulsion to the surface for producing more crude oil more economically and with less energy from a well than for producing unemulsified crude oil from the well utilizing expensive chemicals which are prohibitive in cost, practicality, and safety.

4. A system for transporting crude oil at temperatures above 32° F. through a pipeline with decreased resistance to flow comprising,

(a) means for supplying water and crude oil to a mixing means,

(b) said mixing means comprising means for mixing only water with the crude oil until an emulsion consisting of water and oil passes through the inversion point where the emulsion changes from a water-in-oil emulsion to a lower viscosity oil-in-water emulsion at temperatures above 32° F. that contains, by volume, about 5 percent to 9 percent oil and 95 percent to 91 percent water, respectively, and

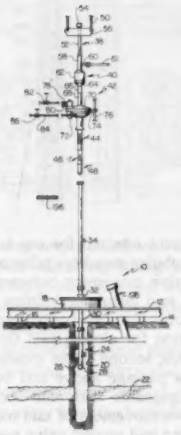
(c) propulsion means for transporting said oil-in-water emulsion at temperatures above 32° F. through the pipeline whereby more oil can be transported through the pipeline when so emulsed with water more economically and less energy is required than for transporting unemulsified crude oil in the pipeline utilizing expensive chemicals which are prohibitive in cost, practicality, and safety.

4,100,968

TECHNIQUE FOR RUNNING CASING

Charles George Delano, 6449 Long Meadow, Corpus Christi, Tex. 78413

Filed Aug. 30, 1976, Ser. No. 718,476
Int. Cl.[2] E21B *23/00, 3/02*
U.S. Cl. 166—315 19 Claims



1. A method of making up pipe joints, each having an internal passage providing an intermediate unthreaded internal surface, an end female threaded section and an end male threaded section, adjacent a rotary table on a drilling rig and running the pipe in a well, comprising

temporarily vertically suspending a first pipe joint through the rotary table in a position with one of the threaded sections exposed;

engaging and connecting the intermediate unthreaded internal surface of a second pipe joint with a tool and defining an open annulus between the tool and second joint;

positioning the second pipe joint above and in alignment with the first joint by the use of the tool;

lowering the second joint into threading engagement with the exposed threaded section of the first joint;

relatively rotating the first and second joints through the tool connection for making up the threaded sections thereby connecting the first and second joints;

pumping fluid through the tool into the connected pipe joints while the tool and pipe joints are connected;

sealing the annulus between the tool and second pipe joint for directing all fluid into the pipe joint;

releasing the first joint from suspension through the rotary table;

lowering the first and second joints through the rotary table into the well through the tool connection; and

temporarily vertically suspending the second joint through

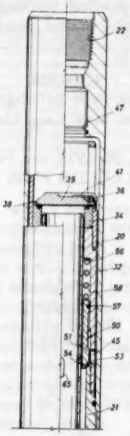
the rotary table in a position with one of the threaded sections exposed.

4,100,969

TUBING TESTER VALVE APPARATUS

Ervin Randermann, Jr., Beasley, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,269
Int. Cl.[2] E21B *43/12;* F16K *31/16*
U.S. Cl. 166—324 13 Claims



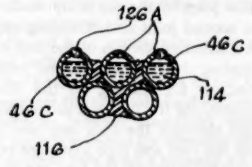
1. Valve apparatus adapted for use in a well, comprising: inner and outer tubular members telescopically disposed and arranged for relative movement between extended and contracted positions, said members defining a flow passage; first valve means responsive to relative movement of said members to extended position for closing said flow passage to downward flow of fluids; second valve means for equalizing pressures in said flow passage above and below said first valve means; means engageable with said second valve means in response to relative movement of said members to contracted position for shifting said second valve means to open position; and spring-loaded actuator means also responsive to movement of said members to said contracted position for opening said first valve means subsequent to the opening of said second valve means.

4,100,970

PANEL FORMED OF HOLLOW PLASTIC BALLS CONTAINING A FIRE RETARDANT LIQUID

Alvin Kreske, Jr., Rte. 5, Box 407, Valparaiso, Ind. 46383

Filed Oct. 7, 1974, Ser. No. 512,847
Int. Cl.[2] A62C *35/10;* E04B *1/92*
U.S. Cl. 169—57 6 Claims



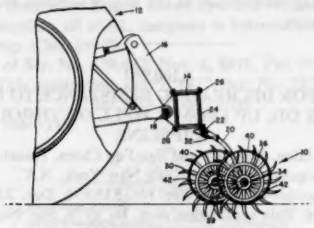
1. A panel for use in building construction comprising a plurality of hollow balls having a thickness at least equal to a multiple of the average cross section of the hollow balls, each ball abutting a plurality of other balls of the panel and adhering thereto to form a self supporting structure, each of said balls having a substantially symmetrical exterior surface and a portion of all of the balls on at least one surface of said panel extending t a common contour, said balls being constructed of plastic which softens responsive to temperatures above a threshold value, at least a portion of the balls on said one surface of the panel containing a fire retardant liquid which vaporizes at temperatures above the threshold value, whereby subjecting the panel to temperatures above the threshold value softens the plastic of the balls and vaporizes the fire retardant liquid to cause the balls containing the fire retardant liquid to rupture and release vapor of the fire retardant liquid.

4,100,971

ROTARY HOE STRIPPING MEANS

Darrel Lee Honnold, Winterset, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 2, 1976, Ser. No. 710,237
Int. Cl.[2] A01B *23/00*
U.S. Cl. 172—547 10 Claims



1. A rotary hoe wheel of the type having a central hub member and a plurality of radially extending tine members secured to the hub, the improvement residing in a tine cleaning means comprising: a separate ring member closely adjacent each side of the wheel, the diameter of said ring members being equal to or less than the wheel; and means loosely coupling the ring members together for limited movement relative to one another, for rotation with the wheel and for radial sliding movement along the tine members in substantial unison.

4,100,972

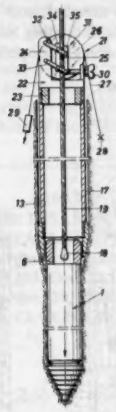
DISPLACEMENT HAMMER APPARATUS FOR SINKING AND LINING BOREHOLES

Paul Schmidt, Reiherstrasse, 5940, Lennestadt, Saalhausen, Germany

Filed Mar. 11, 1977, Ser. No. 776,914
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611677
Int. Cl.[2] E21B *11/02*
U.S. Cl. 173—23 4 Claims

1. In apparatus for sinking a borehole in the ground, said apparatus comprising a self-propelled displacement hammer including a tubular housing having a front end and a rear end, and a percussion mechanism for driving said housing forwards in the direction of said front end, the improvement comprising a follow-up tube, means for attaching said follow-up tube to said rear end of said housing, a bracing cable device and means for mounting said bracing cable device on said follow-up tube at an end thereof remote from said housing, said bracing cable device including a bracing cable and means for exerting an axial push on said tube from said bracing cable, said bracing cable device further including a bearing piece, means for mounting said bearing piece at said end of said follow-up tube remote from said housing, a cable guide sheave, means rotatably mounting said sheave on said bearing piece, means extending said bracing cable over said sheave, means for fixing one end of said cable and a pulling device fixed to the other end of said cable for tensioning said cable to exert said push on said

tube, a clamping device carried on said bearing piece, a pulling rope extending from said housing through said follow-up tube, said clamping piece being operative to clamp said pulling rope



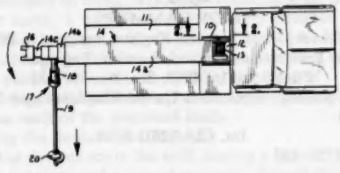
to said tube, a cap fixed in the rear end of said housing, means defining a rope pocket in said cap, and means fixing one end of said rope in said rope pocket.

4,100,973

SIDE LOAD PROTECTION ARRANGEMENT FOR ROTATING EQUIPMENT

Frank D. Freudenthal, Saint Joseph, Mo., assignor to Altec Industries, Inc., Saint Joseph, Mo.

Filed Apr. 5, 1976, Ser. No. 673,600
Int. Cl.[2] E21C 5/00
U.S. Cl. 173—44 **7 Claims**



1. A rotation drive mechanism for driving a rotatably supported body which is subject to being side loaded in a manner tending to rotate the body, said drive mechanism comprising:

a motor having an activated state and a deactivated state;

drive linkage coupling said motor with said body to drivingly rotate the latter;

a brake mechanism associated with said drive linkage, said brake mechanism being yieldably biased into engagement to prevent rotation of the body when said motor is deactivated and operable to release from engagement to permit rotation of said body when said motor is activated; and

a brake release means operable when said motor is in a deactivated state to at least partially disengage said brake mechanism to allow back driving of the body when the side load to which said body is subjected exceeds a preselected level,

said brake release means comprising:

a fluid chamber for receiving pressurized fluid to act on said brake mechanism to partially release same;

a fluid supply line leading to said chamber for delivering pressurized fluid thereto through an inlet port;

means responsive to side loads on said body for forcing pressurized fluid through said supply line and into said chamber with said motor deactivated; and

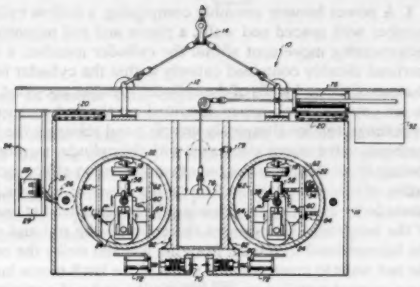
said fluid chamber having an outlet port, said outlet port being an orifice substantially smaller in size than said inlet port.

4,100,974

MACHINE SUSPENDED FROM A CRANE OR SIMILAR DEVICE FOR DRIVING AND EXTRACTING PILING AND THE LIKE

Charles R. Pepe, Old Quarry Rd., Alpine, N.J. 07620

Filed Jan. 6, 1977, Ser. No. 757,206
Int. Cl.[2] E02D 7/06
U.S. Cl. 173—49 **12 Claims**



1. A machine for being suspended from a crane, or a similar device, for driving and extracting piling and the like with forces which simulate the impact obtained with a conventional reciprocating pile hammer, said machine comprising:

a horizontal support member;

a frame below the horizontal support member;

suspension means coupling the horizontal support member and the frame for permitting vertical movement of the frame toward and away from the horizontal support member;

a pair of races located side by side in the frame and defining a corresponding pair of paths of travel spaced horizontally from one another and located in a common vertical plane, the races being circular and each having a diameter of about 24 inches to about 72 inches;

a heavily weighted roller mounted for rotation within each race, each roller weighing between about 200 pounds and about 1000 pounds and being rotatable about a horizontal axis perpendicular to the common vertical plane;

means for rotating the weighted rollers in synchronism at a low rate of rotation to move each roller along a corresponding path of travel whereby the rollers will generate forces upon the frame, the rate of rotation being about 50 to about 800 revolutions per minute and the synchronism being such that the horizontal components of the forces are in opposite directions and cancel one another, while the vertical components of the forces are in the same direction and establish alternating upward and downward forces which simulate the impact of a conventional reciprocating pile hammer;

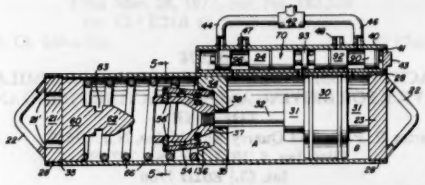
the horizontal support member being weighted so as to tend to remain stationary while the frame is displaced vertically relative to the support member in response to rotation of the weighted rollers; and

the suspension means including resilient means enabling vertical displacement of the frame relative to the support member in the range of about 1 inch to about 5 inches.

4,100,975
POWER BOOSTER

Gladys T. Jarman, Brunswick, Ga., assignor to Davis R. Jarman and Virgil Hinson, both of Brunswick, Ga.

Filed Apr. 27, 1976, Ser. No. 680,795
Int. Cl.[2] H01R 5/00
U.S. Cl. 173—91 2 Claims



1. A power booster assembly comprising; a hollow cylinder member with spaced end walls, a piston and rod mounted for reciprocating movement within the cylinder member, a hammerhead slidably contained entirely within the cylinder biased to a one of the end walls of the cylinder member provided with an air passage, latch means mounted on the rod and spaced from the piston for alternately gripping and releasing the hammerhead, valve means associated with the cylinder member for feeding input fluid into the cylinder member to effect reciprocation of the piston within the cylinder member, and the latch means being arranged for releasing the hammerhead at one end of the longitudinal movement thereof with the rod and cause the hammerhead to release from the rod and strike the one of the end walls to create a shock thereon, the latch means including a support member on the connecting rod and opposite the piston and at least one latching finger on the support member for catching and releasing a projecting member extending from the hammerhead and facing inwardly of the cylinder member, the latch means including means having a cam surface arranged substantially midway of the cylinder member for engagement with the latching finger to effect the release thereof from the latch connection with the hammerhead projection, adjustable means provided between the cam surface and the latching finger for varying the point of engagement therebetween, the at least one latching finger being a plurality of like latching fingers and associated adjusting means, and the adjusting means including an adjustable set screw provided with a cam ball on one end thereof and appropriately mounted by means of the screw portion in associated screw threaded apertures in the ends of each finger.

4,100,976
PNEUMATIC IMPACT DRILLING TOOL

Charles W. Stone, Garden City, Mich., assignor to Reed Tool Co., Houston, Tex.

Filed Dec. 6, 1976, Ser. No. 748,011
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—133 10 Claims

1. An impact drilling tool for connection in a string of drilling pipe comprising

an upper sub for connection to said drilling pipe,

a casing with an upper end connected to said upper sub,

an anvil member slidably positioned in the lower end of said casing and having a bit member on its lower end extending outside said casing,

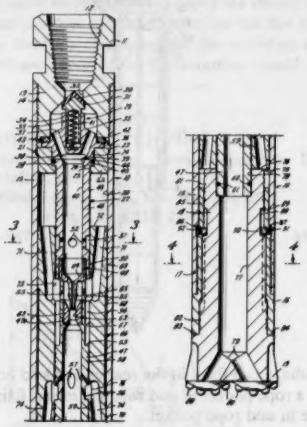
a hammer piston positioned in said casing above said anvil member for reciprocal movement longitudinally of said casing to strike said anvil member repeatedly,

a feeder tube for feeding compressed pneumatic fluid from said drilling pipe extending longitudinally of said casing through said hammer piston and into the upper end of said anvil member,

a venturi member positioned in said feeder tube intermediate the ends thereof and within said hammer piston for producing a partial vacuum adjacent thereto upon passage of pneumatic fluid therethrough at a high velocity,

a passageway extending through the wall of said feeder tube from a point adjacent said venturi member to a point within said hammer member, and

a plurality of passages, including said last-named passageway, and valve openings cooperable therewith in said

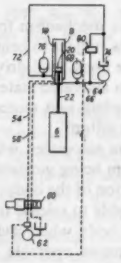


feeder tube and said hammer piston to apply compressed pneumatic fluid to one end of said hammer piston and said vacuum to the other end thereof when in one position and to apply vacuum to said one end and compressed pneumatic fluid to said other end when said hammer piston is in another position, for effecting reciprocal movement thereof substantially all of the spent penumatic fluid exhausting from said tool through said passageway.

4,100,977
DROP HAMMERS

Roger Michael Elliott, Ipswich, England, assignor to BSP International Foundations Limited, Ipswich, England

Filed May 16, 1977, Ser. No. 797,232
Claims priority, application United Kingdom, May 21, 1976, 21195/76
Int. Cl.[2] B25D 9/00
U.S. Cl. 173—134 4 Claims



1. A drop hammer comprising a hammer weight, a hydraulic ram connected to said weight for displacing said weight, said ram comprising an upwardly extending cylinder and a piston slidable in said cylinder, respective internal chambers of the cylinder being formed thereby above and below the piston, an outer casing surrounding the cylinder, an outer annular space being formed thereby between the cylinder and the outer casing, said space being in permanent communication with an upper end of the cylinder chamber above the piston, a hydrau-

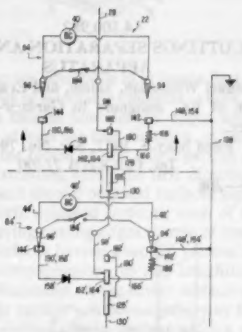
lic pressure source for supplying pressure fluid to said chambers, a control valve for said fluid and for interconnecting said internal chambers of the cylinder and being disposed at the lower end of the cylinder and co-axially with the cylinder and piston, said outer annular space forming a continuation of said cylinder chamber above the piston leading to the control valve, control means comprising a control device externally of said valve and connected thereto for actuating the valve to control the supply of pressure fluid and to connect and disconnect the internal chambers of the cylinder for reciprocation of the hammer weight.

4,100,978

TECHNIQUE FOR DISARMING AND ARMING ELECTRICALLY FIREABLE EXPLOSIVE WELL TOOL

Gene T. Boop, 3922 Devonshire, Corpus Christi, Tex. 78413

Division of Ser. No. 535,355, Dec. 23, 1974, Pat. No. 4,007,796.
This application Nov. 29, 1976, Ser. No. 745,686
Int. Cl.[2] E21B *43/116*
U.S. Cl. 175—4.55 **8 Claims**



1. A method of using, in a well extending from the surface into the earth, a plurality of electrically fireable explosive devices each having a pair of terminals, and a pair of electrical leads enabling electrical communication between the surface and the pairs of terminals comprising the steps of

separating, at the surface, a plurality of the pairs of terminals from each of the electrical leads;

running the devices into the well;

after the devices are in the well, arming a first device including connecting the pair of terminals thereof to the pair of leads while maintaining the other devices unarmed;

passing an electrical current through the pair of leads and terminals of the first device and detonating the first device; and

arming a second of the devices including connecting the pair of terminals thereof to the pair of leads while maintaining the other unfired devices unarmed.

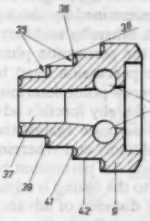
4,100,979

PNEUMATIC PERCUSSION BORING DEVICE

Paul Schmidt, Reiherstrasse, Lennestadt, Fed. Rep. of Germany (594)

Filed Dec. 17, 1976, Ser. No. 751,970
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558842
Int. Cl.[2] E21B *11/02*
U.S. Cl. 175—19 **6 Claims**

1. A pneumatic percussion earth boring device comprising: a tubular housing having a forward end and a rearward end; a percussive boring tool mounted generally centrally of said housing in said forward end thereof, said percussive boring tool being configured to chisel into an earth formation when said tool is percussively reciprocated in said housing; a percussive piston mounted for reciprocating movement in said housing and adapted upon forward reciprocating movement thereof to act percussively on said boring tool; pneumatic means for reciprocating said piston; a displacement piece mounted on said boring tool for reciprocal motion therewith in order to laterally displace earth about said boring tool when said earth boring device is operating to traverse an earth formation for forming a boring therethrough; and a plurality of cutters on said displacement piece, each of said cutters comprising an annular knife edge extending about said displacement piece, said knife edges of each cutter being spaced apart axially of said boring tool and arranged concentrically thereabout with the diameters of said knife edges increasing stepwise in a direction rearwardly of said displacement piece, and an annular concave undercut portion facing forwardly of said displacement piece extending radially inwardly of said displacement piece from each of said knife edges.

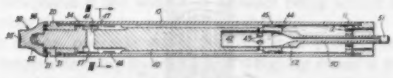


4,100,980

SELF-PROPELLED PNEUMATIC BURROWING DEVICE

Gustav Jenne, Essen-Kettwig, Fed. Rep. of Germany, assignor to Jenne & Strahm AG fur Tiefbautechnik, Sarnen-Wilen, Switzerland

Filed May 27, 1976, Ser. No. 690,629
Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524210; May 31, 1975, 2524211
Int. Cl.[2] E21B *11/02*
U.S. Cl. 175—19 **12 Claims**



1. A pneumatic burrowing device designed to propel itself through the ground along a straight line by crushing and/or displacing the materials which it encounters in its path, the device comprising in combination:

an elongated tubular casing defining a cylindrical bore and a longitudinal center axis and movement axis of the device;

a percussion head arranged on the forward extremity of the casing in alignment with said center axis and guided so as to be axially freely movable a limited distance in relation to the casing;

two pairs of cooperating axial abutment faces defined by the casing and by the percussion head, respectively, said abutment faces determining between them the distance over which the percussion head is freely displaceable;

means for axially respositioning at least one of said abutment faces relative to the other abutment faces so as to adjust said distance of displaceability;

a massive percussion plunger received and guided inside said casing bore for reciprocating axial fore and aft movements, the percussion plunger having a rearwardly open control bore in its rear portion;

a control barrel arranged in axial alignment with the casing bore and reaching from the rear of the device a distance into the casing bore, the control barrel being held in place by the casing and having connected to it a rearwardly

extending supply line for compressed air, while carrying on its forward extremity an outwardly cylindrical control barrel head matching in its diameter the control bore of the percussion plunger and serving as a plunger valve in cooperation with the latter; and

air flow controlling means defined by said percussion plunger bore and said cooperating control barrel head for deriving from a flow of compressed air received through said supply line a continuously cycling reciprocating motion of the percussion plunger between axial stroke limits which are determined by the axial position of said control barrel head, whereby said barrel head is normally so positioned that the percussion plunger, in its forward motion, strikes the percussion head before reaching the forward stroke reversal point determined by said air flow controlling means, thereby forcibly advancing the percussion head a certain distance against the materials situated in the path of the device; and wherein

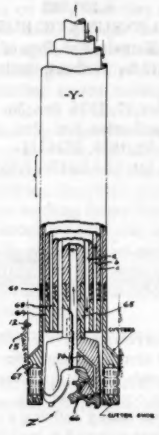
the distance over which the percussion head is axially freely displaceable in relation to the casing is adjustable to be slightly greater than the normal distance of advance of the percussion head in the ground per impact.

4,100,981

EARTH BORING APPARATUS FOR GEOLOGICAL DRILLING AND CORING

John D. Chaffin, 851 Haverford Ave., Pacific Palisades, Calif. 90272

Filed Feb. 4, 1977, Ser. No. 765,679
Int. Cl.[2] E21B *49/00, 7/18, 21/00*
U.S. Cl. 175—60 **58 Claims**



1. A method of drilling and continuously sampling geological formations and including the steps of:

forming a continuous bore hole in the earth by drilling with a multiplicity of at least two concentric drill pipes and each of which rotates a drill bit;

removing particulate matter from the drill bits at the bottom of the bore hole by means of reverse air vacuum and entrainment thereof in at least one fluid circuit pumped through the center drill pipe and annulus within the other drill pipe;

separating the entrained particulate matter from said fluid circuit;

and, continuously collecting the separated particulate matter for disposition and core sampling.

18. Apparatus for drilling and continuously sampling geological formations, and including:

a multiplicity of at least two concentric drill pipes defining fluid channels extending centrally therethrough and therebetween, and separate drill means carried at the lower end of the central and outermost drill pipes respectively for forming a continuous bore hole in the earth;

means for driveably rotating, raising and lowering said concentric drill pipes, and having a swivel-manifold with separate connections in fluid communication with fluid channels extending centrally therethrough and therebetween;

means for selectively pumping fluid through said swivel-manifold in separate communication with said fluid channels;

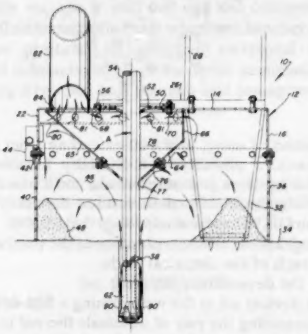
and, means continuously separating particulate matter entrained in said fluid from the drill means at the bottom of the bore hole, for disposition and core sampling.

4,100,982

DRILL CUTTINGS SEPARATION AND CONTROL APPARATUS

Brendan Michael Wilkinson, Salem, and Erasmo Belfiore, Roanoke, both of Va., assignors to Gardner-Denver Company, Dallas, Tex.

Filed May 5, 1977, Ser. No. 794,273
Int. Cl.[2] E21B *21/00*
U.S. Cl. 175—206 **8 Claims**



1. A drill cuttings separation and control apparatus for use with a rock drill rig wherein drill cuttings are forcibly ejected from the drill hole by pressure air, said apparatus comprising:

a hood including a transverse deck and depending sidewalls engageable with the ground surface to form a first substantially enclosed space around a drill hole;

an opening in said deck for admitting a drill stem into said drill hole;

flexible sealing means disposed in said opening and around said drill stem;

a drill cuttings deflector disposed within said first enclosed space and characterized by a conical wall portion disposed around and spaced from said drill stem, and a base contiguous with said deck, said conical wall portion depending from said base toward said drill hole;

said deflector defining in part a second enclosed space;

aperture means formed in said deflector for admitting air and air-borne drill cuttings from said first enclosed space to said second enclosed space; and,

an opening into said second enclosed space and in communication with means for evacuating air and air-borne drill cuttings from said first enclosed space and said second enclosed space.

4,100,983
BORING DEVICE

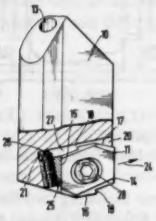
Lothar Herrmann, Metzingen, and Gotthold Schur, Riederich, both of Fed. Rep. of Germany, assignors to Firma Botek Praezisions-Bohrtechnik Schur & Co., Riederich, Fed. Rep. of Germany

Filed May 10, 1976, Ser. No. 684,979

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522565; Dec. 18, 1975, 2556943

Int. Cl.[2] E21B *9/00*

U.S. Cl. 175—383 **8 Claims**



1. In a boring device adjustable in at least a first radial direction for boring holes of selectable diameter, a bore head having an external recess therein bounded by upper and lower surfaces extending in at least the first direction, at least one of the lower surfaces of the recess having a first pattern of longitudinal indentations extending along the first direction, a cutting plate having first and second opposed surfaces separated by at least third and fourth opposed surfaces, each of the first and second surfaces having cutting edges therein at least one of the third and fourth surfaces having a second pattern of longitudinal indentations complementary to and interfitting with the first pattern of indentations on the lower surface of the recess whereby said lower surface provides a guideway for the radial adjustment of the cutting plate when the cutting plate is positioned within the recess, the cutting plate further having an elongated central slot extending substantially parallel to the third and fourth surfaces of the cutting plate, and releasable securing means cooperable with the slot in the cutting plate for reversibly supporting the cutting plate in the recess with a selected one of the third and fourth surfaces thereof contacting the lower surface of the recess.

4,100,984
NET WEIGHER WITH BUILT-IN CHECKWEIGHER

King L. Klopfenstein, Prospect Heights, and Robert H. Connors, Chicago, both of Ill., assignors to Triangle Package Machinery Co., Chicago, Ill.

Filed Jul. 2, 1976, Ser. No. 702,354

Int. Cl.[2] G01G *13/04*

U.S. Cl. 177—50 **13 Claims**

1. Apparatus for controlling the weight of product charges fed into a vertically displaceable receptacle, comprising

(a) bulk feeder means for feeding product to said receptacle;

(b) dribble feeder means for feeding product to said receptacle at a rate slower than that of the bulk feed, after the bulk feed stops,

(c) weighing means, including an electronic sensing device with related electronic circuitry, operatively associated with said receptacle and operable to detect the displacement of said receptacle thereby to sense the weight of product in said receptacle, said weighing means having

(1) a bulk feed cut-off setting,

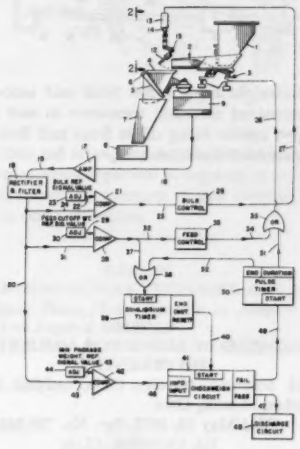
(2) a dribble feed cut-off setting which is different than said bulk feed cut-off setting, and

(3) a minimum package weight setting which is different than either of said bulk feed cut-off setting or said dribble feed cut-off setting,

(d) bulk feed control means operable in response to said sensing device sensing said bulk feed cut-off setting to provide a signal to stop flow of product from said bulk feeder means when the apparent weight of product in said receptacle being sensed is at least equal to the bulk feed cut-off setting,

(e) first dribble feed control means operable in response to said sensing device sensing said dribble feed cut-off setting to provide a signal to stop flow of product from said dribble feeder means when the apparent weight of product in said receptacle being sensed is at least equal to the dribble feed cut-off setting,

(f) said weighing means also including checkweighing means operable after the flow of product to said receptacle from



said dribble feeder means has stopped to determine whether the weight being sensed by said sensing device is over or under said minimum package weight setting,

(g) second dribble feed control means operable after operation of said checkweighing means and in response thereto to provide a signal to activate the same dribble feeder means to feed a further charge of product to the same receptacle if the weight of product being sensed is less than the minimum package weight, and

(h) means, operable when the weight of product in said receptacle being sensed by said weighing means is at least equal to the minimum package weight setting, to discharge product from said receptacle.

4,100,985
VIBRATION-RESISTANT BALANCE

Eugen Meier, Meilen, Switzerland, assignor to Mettler Instrumente Ag, Greifensee-Zurich, Switzerland

Filed May 2, 1977, Ser. No. 792,598

Claims priority, application Switzerland, Oct. 8, 1976, 12789/76

Int. Cl.[2] G01G *23/12*

U.S. Cl. 177—189 **6 Claims**

1. In a balance, in combination:

(a) a support;

(b) an elongated pan carrier;

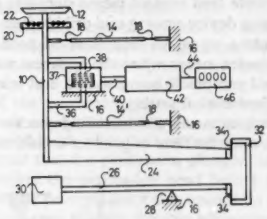
(c) guide means pivoted to said support for angular movement about a first axis and connected to said pan carrier for guiding movement of the same toward and away from a position of equilibrium relative to said support, the direction of elongation of said pan carrier during said movement thereof remaining parallel to said direction of elongation in said position of equilibrium;

(d) electrically operated means for opposing said movement;

(e) a lever mounted on said support for pivoting movement about a second axis, said lever having two arms;

(f) coupling means coupling one of said arms to said pan carrier for joint movement; and

(g) a counterweight on the other arm of said lever, said



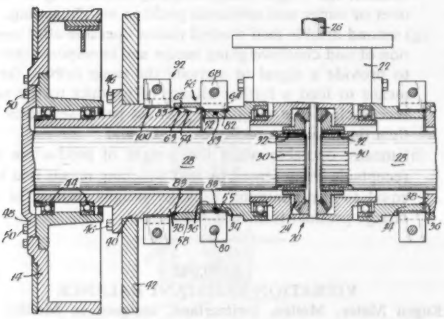
counterweight being offset from said second axis in a predetermined direction transverse to said second axis, said pan carrier being offset from said first axis in said predetermined direction.

4,100,986

SPLIT PILLOW BLOCK FOR MOUNTING A DIFFERENTIAL

William M. Shipitalo, Novelty, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 20, 1977, Ser. No. 799,068
Int. Cl.[2] B60K *17/16*
U.S. Cl. 180—75 **11 Claims**



1. In a vehicle, the combination of:

a vehicle frame;

an elongated, hollow wheel spindle mounted on said frame;

a wheel rotatably mounted on one end of said spindle;

a differential gear assembly having a housing with a tubular protrusion terminating in an opening aligned with the other end of said spindle;

a drive shaft within said spindle and removably connected to said wheel and to said differential gear assembly; and

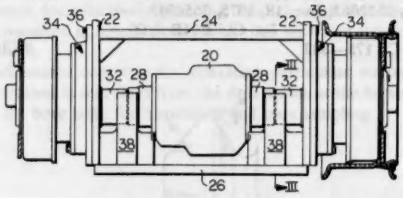
a split pillow block interconnecting said spindle other end and said housing and including a tubular collar disposed about one of said spindle other end and said protrusion, an integral partial collar disposed partially about the other of said spindle other end and said protrusion, and a separate partial collar mating with said integral partial collar and removably secured thereto about said other of said spindle other end and said protrusion.

4,100,987

CRADLE FOR A DIFFERENTIAL

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 9, 1977, Ser. No. 795,038
Int. Cl.[2] B60K *17/16*
U.S. Cl. 180—75 **11 Claims**



1. A lift truck comprising:

means defining a vehicle frame including spaced side frame members;

wheels on said frame including two final drive units, one on each side of the frame and secured thereto;

a differential mounted on said frame and connected to both said final drive units, said differential including a housing having opposed, outwardly directed drive train component tunnels extending to a corresponding one of said final drive units; and

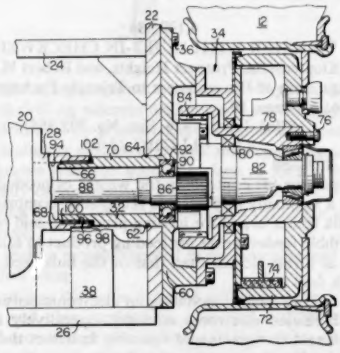
a pair of cradles on opposite sides of said frame, each having a generally upwardly facing differential tunnel supporting surface, each said surface having substantially the same shape as the adjacent part of the corresponding tunnel and being slightly larger in size to support the differential during assembly while allowing minimal shifting thereof to achieve alignment of parts during assembly.

4,100,988

VEHICLE INCLUDING DIFFERENTIAL MOUNTING

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 9, 1977, Ser. No. 795,039
Int. Cl.[2] B60K *17/16*
U.S. Cl. 180—75 **4 Claims**



1. In a vehicle such as a lift truck or the like, the combination of:

a vehicle frame having two spaced apart side frame members;

drive means for the vehicle including a differential having a housing disposed between said frame members with oppositely directed drive train tunnels extending towards a respective one of said frame members;

an opening in each side frame member and aligned with the associated drive train tunnel;

a pair of final drive units including wheel spindles, one on each side of said frame, and each final drive unit having a mounting plate abutting an associated side frame member on the side thereof remote from said differential, and a sleeve for housing a drive component and extending from the mounting plate through the opening in the associated side frame member for connection to the associated tunnel; and

means securing each said mounting plate to the associated side frame member;

whereby loading on said vehicle will be transmitted directly to said vehicle frame and said differential will not support vehicle loads.

4,100,989

PNEUMATIC CELL FOR GAS CONFINEMENT IN SURFACE EFFECT VEHICLE

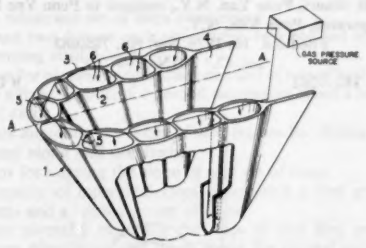
Jean Luc Y. Barbot, Les Lilas, and Philippe M. Remon-Beauvais, Ris-Orangis, both of France, assignors to Etat Francais, Paris, France

Filed Jun. 23, 1976, Ser. No. 698,813

Claims priority, application France, Jun. 27, 1975, 75 20205

Int. Cl.[2] B60V *1/16*

U.S. Cl. 180—127 **21 Claims**



1. A flexible gas cushion confinement cell for a ground-effect vehicle, which comprises two flexible walls (2,3) which extend substantially parallel to one another, and flexible partitions (5) which extend transversely of the walls (2,3) and which join them together over at least part of their height, said walls (2,3) defining in conjunction with one another and with said partitions (5) juxtaposed compartments (6) which have open upper ends to enable them to be connected to means for supplying gas under pressure, and which are at least substantially closed at their lower ends, said walls being at least partly in the form of part of a truncated conoid and cooperatively defining a frustoconoidal sector having major and minor bases at said upper and lower ends respectively.

4,100,990

STEERING APPARATUS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,900

Int. Cl.[2] B62D *5/10*

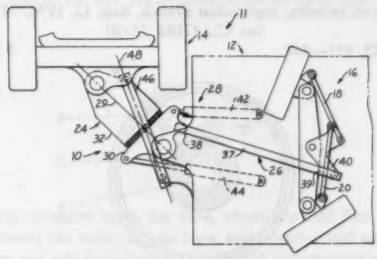
U.S. Cl. 180—135 **7 Claims**

1. Steering apparatus for a vehicle having first and second sections and Ackerman steering apparatus connected to said first section, comprising:

a coupling assembly connected to said first and second sections and being laterally, pivotally movable toward and from the first section and toward and from the second section;

means for moving said first section relative to said coupling assembly; means for automatically controllably changing the lateral orientation of said first section relative to said second section; and

a linkage mechanism pivotally connected to said coupling assembly and Ackerman steering apparatus and being of a



construction and arrangement sufficient for actuating said Ackerman steering apparatus in response to and as a function of the pivotal movement of said coupling assembly relative to said first section.

4,100,991

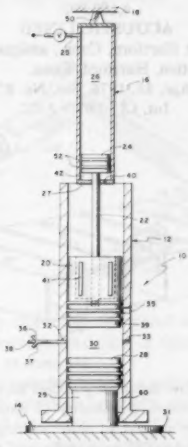
FAST CYCLE SEISMIC GAS EXPLODER AND METHOD

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 11, 1976, Ser. No. 740,704

Int. Cl.[2] G01V *1/10*

U.S. Cl. 181—117 **12 Claims**



1. A method of injecting a compressional pulse into the earth utilizing a seismic gas exploder with a closed expansible detonation chamber formed within an upstanding cylindrical housing between a rigid top and a rigid bottom comprising:

(a) placing said rigid bottom into direct contact with the earth,

(b) injecting a charge of combustible gas mixture into said detonation chamber,

(c) igniting said mixture to initiate a gas explosion adapted to apply a compressional pulse to the earth through said rigid bottom and to drive said rigid top upwardly,

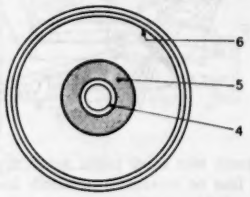
(d) utilizing the upward motion of said rigid top to compress an air spring external to said housing, and

(e) applying the energy of said compressed air spring thereafter to aid gravity acceleration of said rigid top in a downward direction.

4,100,992
LOUDSPEAKER

Weber Louis Rehde, and Joël Anders Rehde, both of 9 rue de la Mairie, Bavans (Doubs), France

Continuation-in-part of Ser. No. 602,003, Aug. 5, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,718
Claims priority, application France, Aug. 12, 1974, 74 27923
Int. Cl.[2] G10K *13/00*
U.S. Cl. 181—166 **5 Claims**

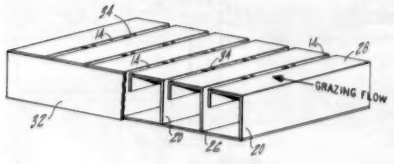


1. A loudspeaker comprising a porous diaphragm having an outside edge, an electromagnetic drive means mounted on a central area of the diaphragm for displacing the diaphragm and a hard ring forming a junction between said diaphragm and said drive means, said diaphragm being totally permeated with a stiffening material in a portion of the area between said ring and said outer edge without increasing the thickness of the diaphragm thereby improving the acoustic characteristics of said loudspeaker as compared with an equivalent unstiffened diaphragm.

4,100,993
ACOUSTIC LINER

Ernest Feder, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,335
Int. Cl.[2] F01N *1/02*
U.S. Cl. 181—213 **5 Claims**



1. An acoustic low frequency sound suppressor liner comprising a backing sheet, a plurality of elongated flat surface members parallelly spaced to said backing sheet defining a facing sheet exposed to the grazing flow of a substantial velocity and sound pressure and upstanding spaced side wall members extending therebetween defining a plurality of sound suppressing cavities, lip means spaced from one of said wall members extending from one edge of each of said flat surface members extending into each of said cavities to define with said one of said wall members a volume chamber supporting a column of air communicating internally of each of said cavities, the width and depth of said volume chamber establishing the mass reactance whereby the depth of each of said cavities is sized for a given sound attenuation by selecting said mass reactance for a predetermined frequency intended to be attenuated, said volume chamber extending in a lateral direction with respect to said grazing flow, each of said upstanding side wall members form a common wall for adjacent cavities and said lip means is angularly spaced with respect to the adjacent upstanding wall and is in a volume increasing direction from the entrance to the exit which together defines the volume chamber.

2. An acoustic low frequency sound suppressor liner mounted in a duct and exposed to grazing flow of fluid having substantially high velocity and high sound pressures, said liner comprising:

a backing sheet;

a plurality of elongated flat surface members parallelly spaced to said backing sheet defining a facing sheet exposed to said grazing flow;

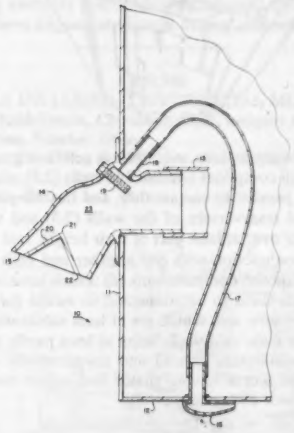
an upstanding, spaced side wall member extending from said backing sheet to one elongated edge of each of said surface members to define a plurality of sound suppressing cavities, said each side wall member forming a common wall between adjacent cavities; and

lip means extending from the other elongated edge of each of said surface members into each of said cavities, said lip means being spaced from one of said wall members to define therewith a volume chamber having a first slot communicating with said grazing flow and a second slot communicating with each of said cavities, the width and depth of said volume chamber cooperating with the volume of the associated cavity to determine the resonant frequency of sound attenuated thereby, said slots extending laterally with respect to said grazing flow.

4,100,994
MARINE EXHAUST SILENCER

Robert B. Stuart, Penn Yan, N.Y., assignor to Penn Yan Boats, Incorporated, Penn Yan, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,683
Int. Cl.[2] F01N *3/04*
U.S. Cl. 181—261 **8 Claims**



1. A silencer for quieting the exhaust output from the output end of an exhaust passageway for a marine engine for a boat, said silencer comprising:

a. the cross-sectional area of said exhaust passage way from said engine being substantially enlarged in a region immediately upstream of said output end for substantially expanding and cooling said exhaust gases just before said exhaust gases reach said output end;

b. an inlet for receiving water from a body of water supporting said boat;

c. means for injecting said water from said inlet directly into said enlarged region of said exhaust passageway; and

d. means for dividing said injected water into particles and mixing said particles with exhaust gases in said enlarged region of said passageway for cooling and quieting said expanding exhaust gases from said engine before said

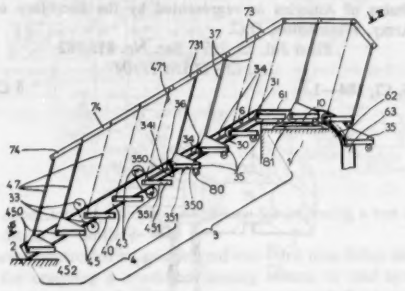
exhaust gases are output along with said injected water from said output end of said passageway.

4,100,995

TELESCOPIC SET OF STEPS WITH VARIABLE SLOPE

Jacques Pradon, 19, avenue des Tourelles, 94100 Saint-Maur-des-Fosses, France

Filed Feb. 14, 1977, Ser. No. 768,430
Claims priority, application France, Feb. 17, 1976, 76 04332
Int. Cl.[2] B63B *29/20*
U.S. Cl. 182—1 **8 Claims**



1. A telescopic set of steps comprising:
at least two frames each comprising two parallel members forming stringboards;
means for pivotally connecting one end of one of said frames to a fixed support, for pivotal movement about a horizontal axis;
means mounting the other of said frames for sliding movement along said one frame;
means for varying the slope of said set of steps;
a plurality of individual steps comprising a first group of steps and a second group of steps;
means pivotally mounting the steps of said first group of steps directly on said other frame for pivotal movement about an axis parallel to said horizontal axis;
means mounting each step of said second group of steps on a respective axle for pivotal movement about an axis parallel to said axes of said first group of steps;
a pair of supports mounted on each end of each axle;
a pair of slideways formed on the said stringboards of said one frame and receiving respective said supports of said axles of said steps of said second group of steps and along which said supports are slidable;
slideway extensions extending said slideways by a distance at least equal to the length of said other frame and being adapted to be arranged on said fixed support;
means for maintaining a constant spacing between the pivot axes of said steps;
means for maintaining the steps parallel to one another; and
means for setting the inclination of at least one said step.

4,100,996

SHOCK ABSORBER FOR A SAFETY BELT LANYARD

Jonathan E. Sharp, 3999 Hillside Pl., Littleton, Colo. 80123

Filed Jun. 6, 1977, Ser. No. 803,551
Int. Cl.[2] E06C *7/18*; A62B *1/16*
U.S. Cl. 182—3 **6 Claims**

1. A web-type shock absorber for a safety belt-lanyard combination to decelerate to a stop the fall of a workman wearing the same, by pulling a selected length of a web through a resistance slide and comprising:
(a) a web of nylon or like material having a short base portion and a free reach in tandem, a first connector loop at the end of the base portion, a second connector loop between the base portion and the free reach and a third connector loop at the end of the free reach and wherein the length of the free reach corresponds to the aforesaid selected length to be pulled through a resistance slide;
(b) a resistance slide including a central bar and side bars in spaced parallelism proportioned to snugly receive the web with the said first loop being upon the central bar and with the end of the free reach adjacent to the said third loop

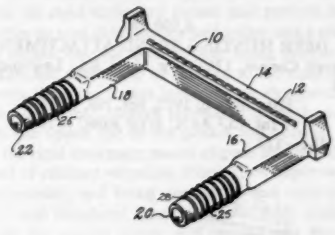
being threaded upon the slide, about the said first loop between the adjacent side bars; and wherein said second loop and said third loop are connected to connector members of the safety belt-lanyard combination to be pulled by the combination in checking a fall with the free reach of the web moving through the resistance slide.

4,100,997

STEP CONSTRUCTION EMPLOYING INSERTABLE FASTENER HAVING DEFORMABLE PROJECTIONS

Bobbie D. Peacock, 702 Hippocket Rd., Peachtree City, Ga. 30269

Filed Jun. 21, 1976, Ser. No. 698,490
Int. Cl.[2] E04F *19/00*
U.S. Cl. 182—90 **1 Claim**



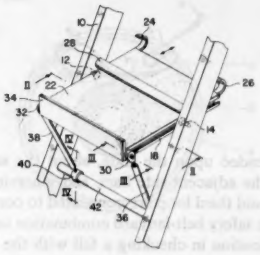
1. In an integrally molded prefabricated step for insertion in a pair of spaced tapered holes drilled or otherwise formed in a solid material such as concrete:
an elongated step member having a pair of outwardly projecting support members integrally molded thereon and rigidly attached substantially at right angles thereto, each of the ends of said support members being tapered for insertion into the corresponding tapered holes and having individual, substantially arcuate and continuous resilient projections integrally molded thereon from plastic material and the like and each of said projections having a slanted face inclined toward the step member and including a marginal edge which is deformable under pressure whereby when said end is driven into a respective opening of less distance than the overall distance between the marginal edges of the projections the projections are deformed and the step is held in place, said deformable members being substantially circular and being progressively larger in diameter from the external terminal end toward the step whereby said respective ends may be aligned with a respective spaced hole and driven into a tapered hole to support said step and to seal the respective holes.

4,100,998

LADDER STEP

Manuel J. Marquez, Salem, Oreg., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,306
Int. Cl.[2] E06C 7/16
U.S. Cl. 182—116 **4 Claims**



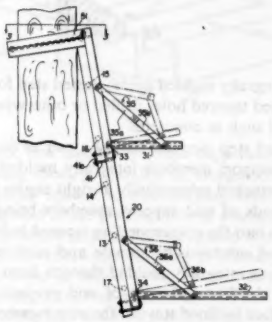
1. An improved ladder step, comprising:
a platform,
the platform attachable to a ladder,
a rugging material attached to an upper surface of the platform,
a front lip attached to a front edge of the platform,
a pivotable bearing attached to a front side of the front edge of the platform,
a support arm dependingly attached to the bearing,
a clamp attached to a lower end of the support arm and releaseably engageable with a lower rung of the ladder,
a rail attached to a lower side edge of the platform, &
a headed bolt attached to an inner side of a rail of the ladder and slidingly engageable by the rail.

4,100,999

DEER HUNTING STAND ATTACHMENT

Joe Derrell Conner, 1265 New Hope Rd., Lawrenceville, Ga. 30245

Filed May 6, 1977, Ser. No. 794,685
Int. Cl.[2] A47C 9/10; E06C 7/16
U.S. Cl. 182—122 **13 Claims**



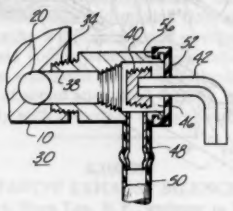
1. An attachment for a ladder to provide a deer hunting stand comprising:
means defining a frame,
a first upper shelf and a second lower shelf,
means pivotally connecting each said shelf to said frame in spaced apart relationship, with the pivotal axes thereof substantially parallel and extending transversely of said first frame,
said shelves in one position thereof extending outwardly of said first frame, and
collapsible means connected to each said shelf and to a said frame for selectively supporting said shelves in said first position thereof,
said shelves being pivotal on said connecting means to a second position substantially parallel to said first frame by collapsing said collapsible supporting means, and
a second frame connected to said first mentioned frame, and means carried by said second frame for connecting said attachment to a tree.

4,101,000

EASY ACCESS OIL FILTER DRAIN SYSTEM

Andrew J. Scully, Mt. Clemens, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 15, 1977, Ser. No. 815,882
Int. Cl.[2] F01M 11/04
U.S. Cl. 184—1.5 **5 Claims**



1. In an engine having an oil filter base bolted to an engine side surface such that the zone immediately beneath the base is obstructed: improved mechanism for draining oil from the base, comprising an auxiliary housing having a horizontal tubular extension threaded into an opening in the exposed side surface of the filter base so that oil within the base can drain outwardly through the horizontal passage formed by said extension; said horizontal passage being internally threaded in the end thereof leading into the housing; a threaded plug normally seated in the threaded portion of the passage to prevent flow of oil from the filter base through the passage; said housing including a frontal mouth opening larger than the diameter of the plug, whereby the plug can be inserted through the mouth opening and thence into the threaded portion of the passage; a flexible front cover connected to the housing for preventing escape of oil through the mouth opening when the plug is unthreaded from the passage; said front cover having a relatively small hole therethrough aligned with the passage axis, whereby a turning implement can be inserted through the hole to rotate the plug without removing the cover; said housing having an external tubular downspout for gravitational discharge of oil from the housing.

4,101,001

DUAL TIMER WITH DELAY

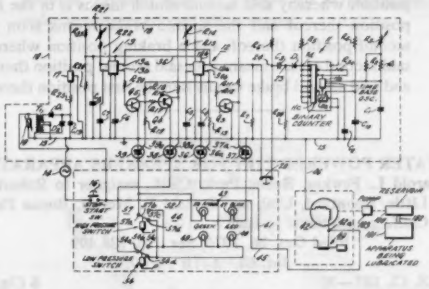
Carl H. Smith, Spring Valley, N.Y., assignor to Auto Research Corporation, Oakland, N.J.

Filed Jun. 1, 1976, Ser. No. 691,615
Int. Cl.[2] F01M 1/18
U.S. Cl. 184—6.4 **17 Claims**

1. System testing apparatus, comprising:
first adjustable time delay means for establishing the frequency at which a test condition is imposed on a system being tested, said first time delay means to generate a test initiating signal at adjustably preset first timing intervals;
second adjustable time delay means responsive to said test initiating signal for establishing a testing interval during which a test condition is imposed on said system being tested, said testing interval being of a significantly shorter duration than said first timing interval;
means controlled by said second adjustable time delay means

for imposing a test condition on said system being tested during said testing intervals;

third adjustable time delay means responsive to said test initiating signal for establishing a third timing interval of a shorter duration than said testing interval, said third timing interval being of sufficient duration to permit said test



condition imposed by said means for imposing a test condition to "settle";

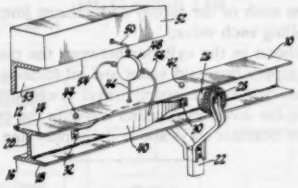
means controlled by said second and third time delay means for coupling a condition sensing means, to said system being tested after the termination of said third timing interval but before the termination of said testing interval.

4,101,002

TRACK MOUNTED LUBRICATION APPARATUS

Ernest W. Almasy, 2416 Second St., Westland, Mich. 48184

Filed Apr. 18, 1977, Ser. No. 788,297
Int. Cl.[2] F16N *7/24, 11/10*
U.S. Cl. 184—15 B **6 Claims**



1. A combination comprising:

an I-beam having a pair of upper flanges, a pair of lower flanges and a web between said flanges;

a pair of conveyor wheels supported on the lower flanges on opposite sides of the web so as to be movable along a path of motion, said conveyor wheels having bearings;

lubrication means mounted adjacent the I-beam including a lubricant reservoir;

nozzle means connected to the lubricant reservoir and operative to deliver lubricant therefrom to a position adjacent the path of motion of the conveyor wheels;

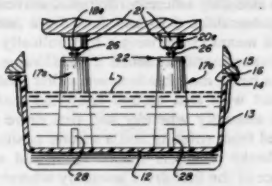
resilient bellows means disposed adjacent said web means and the path of motion of the conveyor wheels such that the volume of the bellows is reduced as the wheels pass the bellows, and means connecting the bellows means to the lubrication means, whereby lubricant is delivered to the wheel bearings as the volume of the bellows means is being reduced.

4,101,003

ISOLATED OIL PAN ASSEMBLY

Sune E. Timour, Columbus, and Thomas D. Littrell, Scipio, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 12, 1977, Ser. No. 758,582
Int. Cl.[2] F16N *31/00*
U.S. Cl. 184—106 **6 Claims**



1. An isolated oil pan assembly for mounting on the underside of an engine block wherein the interior of the latter is provided with rigid stationary means, said assembly comprising a pan for accumulating therein a predetermined amount of oil, said pan having a base, upstanding side walls connected to and delimiting said base, and a continuous ledge extending laterally from the upper edge of said side walls and delimiting an open top of said pan, said ledge being disposed above the level of the predetermined amount of accumulated oil, said open top being adapted to communicate with the interior of said engine block; a continuous seal of resilient vibration isolating, oil impervious material carried on said ledge for sealingly engaging the underside of said engine block; a plurality of elongated sleeve-like pockets formed in said base and extending upwardly therefrom and adapted to be in vertical alignment with the rigid stationary means, said pockets being disposed within an area delimited by said ledge; and a plurality of fastening means, one for each pocket, being disposed within said pockets and adapted to be secured to the rigid stationary means; each fastening means including an elongated element having the upper end thereof projecting through an opening formed in the upper end of the pocket and adapted to be secured to the rigid stationary means aligned therewith, an isolator formed of resilient vibration isolating, oil impervious material encompassing and being carried on and supported by a portion of said elongated element and sealingly engaging the portion of the pocket upper end cirumjacent the opening therein wherein said elongated element is isolated from said oil pan, said pan being adapted to be secured to the underside of the engine block by said elongated elements through the respective isolators.

4,101,004

DRIVE AND STEERING APPARATUS

Herbert D. Oltman, 605 Second St., Hampton, Ill. 61256

Filed Jan. 31, 1977, Ser. No. 764,050
Int. Cl.[2] B62D *11/08*
U.S. Cl. 180—6.2 **5 Claims**

1. A drive and steering apparatus for a vehicle comprising:

a frame;

ground engaging means having a first side and a second side rotatably attached to said frame for moving said vehicle;

a shaft;

means for rotatably attaching said shaft to said frame;

means attached to said frame for rotating said shaft;

a first drive assembly, said first drive assembly having a first and a second frictional surface thereon, said first drive assembly including two drums rigidly connected together, said first and second frictional surfaces of said first drive assembly being located on an interior surface of the drums of said first drive assembly;

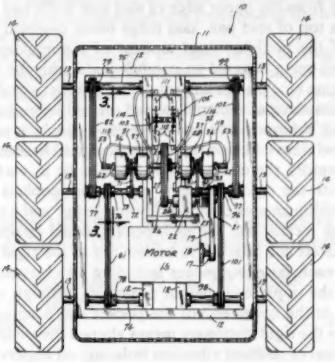
means for rotatably mounting said first drive assembly on said shaft;

means for transmitting rotary motion of said first drive assembly to the first side of said ground engaging means;

a first clutch means attached to said shaft, said first clutch means being movable between a first position in frictional contact with said first frictional surface of the first drive assembly whereby said first drive assembly rotates with said shaft, and a second position whereby said first clutch means is spaced from said first frictional surface of the first drive assembly whereby rotational movement of said shaft is not transmitted to said first drive assembly, said first clutch means comprising a hydraulically actuated shoe;

a first brake means attached to said frame, said first brake means being movable between a first position in frictional contact with said second frictional surface of the first drive assembly whereby said first drive assembly is prevented from rotating and a second position whereby said first brake means is spaced from said second frictional surface of the first drive assembly whereby said first drive assembly is allowed to rotate, said first brake means comprising a hydraulically actuated shoe;

first control means for simultaneously controlling said first clutch means and said first brake means, said first control means having a neutral position whereby the first clutch means and the first brake means are in the second positions thereof respectively, a driving position whereby said first



clutch means is in the first position thereof and the first brake means is in the second position thereof, and a braking position whereby said first clutch means is in said second position thereof and said first brake means is in the first position thereof;

a second drive assembly, said second drive assembly having a first and a second frictional surface thereon;

means for rotatably mounting said second drive assembly on said shaft;

means for transmitting rotary motion of said second drive assembly to the second side of said ground engaging means;

a second clutch means attached to said shaft, said second clutch means being movable between a first position in frictional contact with said first frictional surface of the second drive assembly whereby said second drive assembly rotates with said shaft, and a second position whereby said second clutch means is spaced from said first frictional surface of the second drive assembly whereby rotational movement of said shaft is not transmitted to said second drive assembly;

a second brake means attached to said frame, said second brake means being movable between a first position in frictional contact with said second frictional surface of the second drive assembly whereby said second drive assembly is prevented from rotating and a second position whereby said second brake means is spaced from said second frictional surface of the second drive assembly whereby said second drive assembly is allowed to rotate; and

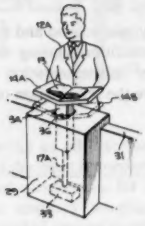
second control means for simultaneously controlling said second clutch means and said second brake means, said second control means having a neutral position whereby the second clutch means and the second brake means are in the second positions thereof respectively, a driving position whereby said second clutch means is in the first position thereof and the second brake means is in the second position thereof, and a braking position whereby said second clutch means is in said second position thereof and said second brake means is in the first position thereof.

4,101,005

WATER POWERED LIFT FOR SPEAKERS APPARATUS

Harold L. Fewkes, Buena Park, Calif., assignor to Robert J. Little, Bountiful, Utah and Ronald E. Morris, Buena Park, Calif., part interest to each

Filed Oct. 26, 1976, Ser. No. 735,499
Int. Cl.[2] A47B *19/00*
U.S. Cl. 187—17 **6 Claims**



1. A lift for speaker's apparatus for use with a source of water under pressure and comprising

a hydraulic cylinder having a piston and a piston rod,

said piston rod being attached to the speaker's apparatus,

a vertical guide for the apparatus;

a water supply line to the cylinder,

a water exhaust line to the cylinder;

a valve in each of the supply and exhaust lines, means for controlling each valve;

an oil column in the cylinder between the piston and the water supply line, said water and oil forming an intimate interface within the piston travel zone, and means for limiting the downward piston travel in the cylinder such that the interface stays above the supply line.

4,101,006

CARRIER TRAVERSE CONTROL FOR A SERIAL PRINTER

Donald F. Jensen, Endicott; Arnold B. Rosenthal, Vestal, and Charles O. Ross, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,647
Int. Cl.[2] B41J *19/30*
U.S. Cl. 400—144.3 **4 Claims**

1. The combination in a printer apparatus,

comprising a carrier movable along the print line of a document,

a print mechanism movable with said carrier including a type element having a plurality of type characters thereon movable on said carrier to present selected ones of said characters into position for printing at successive print locations of said print line,

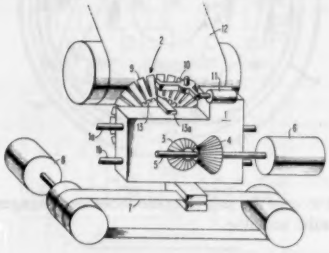
drive means for moving said carrier along said print line,

and means for controlling the motion of said carrier along said print line including

pulse means operable for providing pulses to operate said drive means,

means for determining the number of character positions said type element must move on said carrier to position the next type character for printing,

and means responsive to said determining means for for operating said pulse means at selectively variable rates to provide different ones of a plurality of predetermined pulse sequences to said drive means,



whereby said drive means moves said carrier at a predetermined fixed velocity so long as said number of character positions does not exceed a predetermined number, at selectively variable velocities between print locations when said number of character positions exceeds said predetermined number, and at said fixed velocity during printing of said type characters on said document,

said control means further comprising a read only storage device having a plurality of stored programs each effective to apply different ones of said sequences of pulses from said pulse means to said drive means.

4,101,007

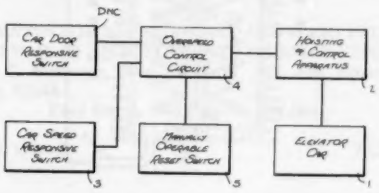
CONTROL SYSTEM FOR LIMITING ELEVATOR CAR MOVEMENT SPEED UNLESS CAR DOORS ARE FULLY CLOSED

John E. Magee, 191 Forest Blvd., Ardsley, N.Y. 10502

Filed Nov. 1, 1976, Ser. No. 737,471

Int. Cl.² B66B 5/06

U.S. Cl. 187—29 R **6 Claims**



1. In an elevator system having an elevator car with at least one door and means for moving said door to an open position and to a closed position and hoisting apparatus for raising and lowering said car, said hoisting apparatus including a drive motor for moving said car and speed control means for setting the speed at which said drive motor moves said car, the combination therewith of door responsive means responsive to the movement of said door to said closed position, speed control responsive means connected to said speed control means and responsive thereto when said control means sets the speed of movement of said car at a value above a predetermined value, and overspeed control means connected to said door responsive means, said speed control responsive means and said hoisting apparatus for stopping said hoisting apparatus when said door is away from said closed position thereof and said speed control means sets said speed of movement of said car at a value which exceeds said predetermined value.

4,101,008

ARRANGEMENT FOR ABSORBING VIBRATIONS

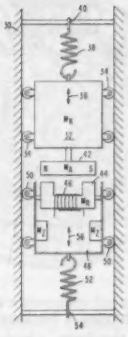
Albert Frosch, Herrenberg; Walter Mannsdöerfer, Aidlingen, and Claus Scheuing, Lorch, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,619

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603688

Int. Cl.² F16F 13/00

U.S. Cl. 188—1 B **8 Claims**



1. In an arrangement for compensating oscillations of the mass forces of a driven oscillating spring-mass main system of a spring-mass auxiliary system, wherein the mass and spring rate of said auxiliary system are identical to the mass and spring rate of said main system, a magnetic means for coupling said systems, with said auxiliary system being operable by said magnetic means in a continuation of the same path of movement of said main system and oscillatable at the same frequency but out of phase with respect to said main system.

4,101,009

NON REACTIVE POSITIONING DEVICE

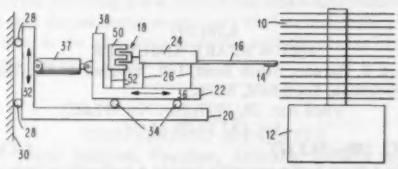
Walter Hehl, Steinenbronn, and Horst Matthaei, Waldenbuch, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,700

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603689

Int. Cl.² F16F 13/00

U.S. Cl. 188—1 B **6 Claims**



1. In an arrangement for compensating oscillations of the mass forces of a driven oscillating spring-mass main system by means of a spring-mass auxiliary system operably guided in a continuation of the same movement path as said main system in a manner that it oscillates at the same frequency as, but out of phase with, said main system, in which said auxiliary system has the same natural frequency as said main system, the im-

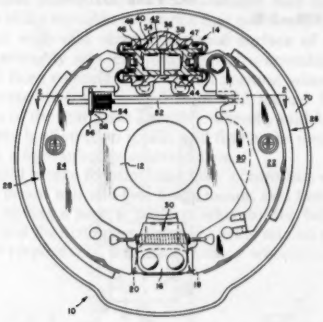
provement comprising a differential lever system for coupling the two said systems to compensate for external spurious forces.

4,101,010

DRUM BRAKE WITH AUTOMATIC ADJUSTMENT

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 5, 1977, Ser. No. 784,764
Int. Cl.[2] F16D *51/20, 65/52*
U.S. Cl. 188—79.5 P **2 Claims**



1. In a drum brake having a backing plate, a pair of brake shoes engageable with the drum, a hydraulic actuator cooperating with adjacent first ends of the pair of brake shoes to urge the pair of brake shoes into a braking position and a parking mechanism cooperating with the pair of brake shoes to also urge the pair of brake shoes into the braking position and an anchor attached to the backing plate and cooperating with adjacent second ends of the pair of brake shoes, the improvement wherein a first resilient member engages said pair of brake shoes opposite said hydraulic actuator and adjacent said anchor in order to urge said pair of brake shoes into engagement with said anchor, said hydraulic actuator including a pair of pistons engageable with said first ends of said brake shoes respectively and a pair of sealing rings cooperating with said pistons and being deformable when said pair of pistons move said pair of brake shoes to the braking position, and a second resilient member carried by said parking mechanism, said first resilient member and said second resilient member creating moments for said pair of brake shoes about said anchor, said moments being substantially equal and opposite to permit said pair of sealing rings to retract said pair of brake shoes from the braking position substantially independently of said first and second resilient members.

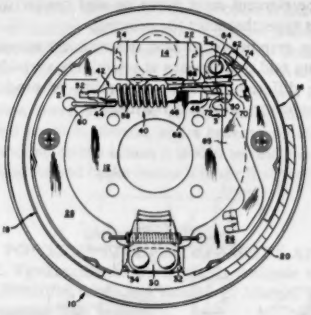
4,101,011

DRUM BRAKE ADJUSTER

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 28, 1977, Ser. No. 791,667
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—79.5 GT **8 Claims**

7. In a drum brake assembly having a hydraulic actuator for urging a pair of brake shoes into engagement with a rotatable member during braking and an extendible member for adjusting the clearance between the rotatable member and the pair of brake shoes, the improvement wherein a pawl pivots relative to one of said pair of brake shoes and engages the extendible member and a single resilient member cooperates with the pawl to provide for extension of the extendible member when the clearance between the pair of brake shoes and the rotatable member is above a predetermined value and said single resilient member also cooperates with said extendible member and



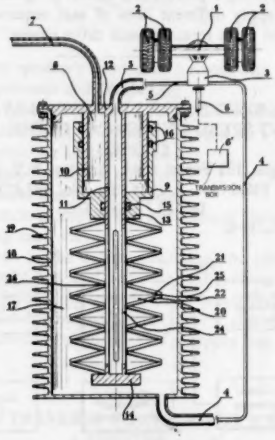
said pawl to urge the pair of brake shoes into engagement with the hydraulic actuator.

4,101,012

HYDROSTATIC BRAKING DEVICE FOR VEHICLES RUNNING DOWNHILL

François Durand, 11 rue du Bateau, 06 Antibes, France

Filed Oct. 4, 1976, Ser. No. 729,364
Claims priority, application France, Oct. 2, 1975, 75 30286
Int. Cl.[2] F16D *57/00*
U.S. Cl. 188—290 **5 Claims**



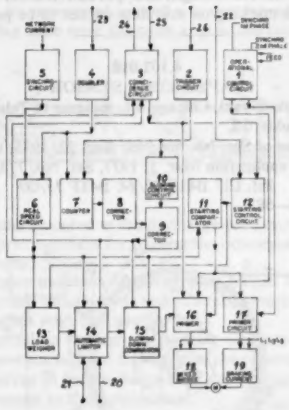
1. A hydrostatic braking device for vehicles having a transmission shaft, a transmission, a wheel axle, and an oil pump driven by the transmission shaft between the transmission and the axle, said braking device comprising a spill valve, the spill valve comprising a central tubular shaft and a pile of Belleville springs surrounding the tubular shaft, the Belleville springs being arranged on the shaft in alternately opposite orientation so that pairs of adjacent springs define spaces between them that are enclosed by a said pair of springs, said tubular shaft opening into said spaces between the Belleville springs, the pump having an outlet communicating with the interior of said tubular shaft whereby when a said vehicle rolls downhill, the pump is driven to force oil into the interior of the tubular shaft and thence into said spaces and between the margins of the pairs of Belleville springs in order to brake said downhill rolling.

4,101,013

PROCESS FOR THE CONTROL AND REGULATION OF THE SPEED OF A MOBILE

Jean Duriez, 119 rue J. Gielee 59000, Lille, and Jean Evin, Hameau de la Becque 59710, Avelin, both of France

Filed Jan. 12, 1977, Ser. No. 758,901
Claims priority, application France, Jan. 15, 1976, 76 01492
Int. Cl.[2] B66B 1/30
U.S. Cl. 187—29 R 9 Claims



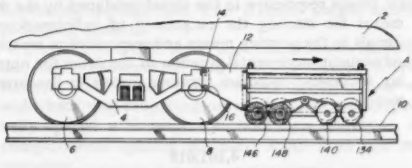
7. A device for controlling and regulating the speed of a mobile for monitoring means for controlling the speed variations by means of a differential voltage which is the result of a comparision of a voltage whose variation represents the evolution of the real speed of the mobile with a control voltage, said voltage tending to follow an ideal control curve of speed variation and comprising a succession of straight sections having lengths corresponding, at least in the case of a slowing down to complete stoppage order, to distances obtained by decoding certain positions of a counter counting the entire distance travelled after the order has been given at a fixed distance from the stopping point, the improvement comprising means for realigning the origin of each section with the reference curve.

4,101,014

APPARATUS FOR REMOVING ICE AND SLEET FROM A THIRD RAIL OF AN ELECTRIFIED RAILWAY VEHICLE

Stuart C. Matheson, 1366 Broadway, Apt. 9H, Somerville, Mass. 02144

Filed Sep. 9, 1977, Ser. No. 831,866
Int. Cl.[2] B60L 5/02
U.S. Cl. 191—62 7 Claims



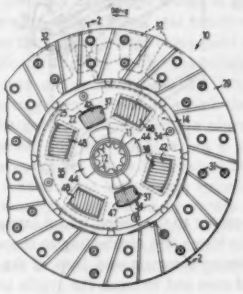
1. Cleaning apparatus for removing ice and sleet from a third rail of an electrified railway vehicle, said apparatus comprising a frame, means for rigidly securing the frame to a wheel truck portion of the vehicle, a vertically adjustable carriage slideably disposed in the frame, rotatable cleaner means arranged at one side of the carriage, means for vertically adjusting the carriage in the frame and moving the rotatable cleaner means into and out of contact with the said third rail of the railway vehicle, and means for actuating the rotatable cleaner means when moved into engagement with the third rail.

4,101,015

VIBRATION DAMPER WITH VARIABLE SPRING RATE AND DAMPING FRICTION

Edmund John Radke, Mount Clemens, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 29, 1976, Ser. No. 755,530
Int. Cl.[2] F16D 3/14, 47/02, 69/00
U.S. Cl. 192—106.2 11 Claims



1. A vibration damper assembly for a vehicle friction clutch comprising a hub operatively connected to a driven shaft, a radial flange integral with said hub, a clutch plate rotatably mounted on said hub and terminating at its outer periphery in oppositely disposed friction facings secured thereto, a spring retainer plate rotatably mounted on said hub and secured to said clutch plate for rotation therewith, said clutch plate and said spring retainer plate sandwiching said hub flange, a plurality of circumferentially spaced first aligned openings in said plates and flange, a torsion spring for each set of said first openings providing a first stage of angular displacement, a plurality of circumferentially spaced second aligned openings in said plates and flange, at least one torsion spring for each set of said second openings, the second openings in said hub flange having a greater arcuate dimension than the second openings in the plates thereby providing a second stage of angular displacement, means to limit the extent of arcuate movement of said plates relative to said hub and flange, a plurality of circumferentially spaced raised cam areas on said flange adjacent said hub separated by depressed areas, and a plurality of depressed cam areas on said spring retainer plate adjacent the inner periphery thereof cooperating with the cam areas on the flange, wherein said plates move relative to said flange over said first stage at a low rate of angular displacement and over said second stage at a higher rate of angular displacement, and said cam areas providing a low friction rate and a high friction rate over said displacement stages, said friction rate shifting from one level to the other simultaneously with the change between stages of angular displacement.

4,101,016

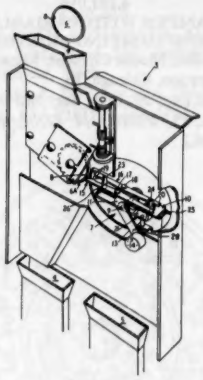
COIN TESTING APPARATUS

Basil James Richards, Vaucluse, Australia, assignor to New Century Novelty Company Pty. Limited, Mascot, Australia

Filed Apr. 18, 1977, Ser. No. 788,563
Claims priority, application Australia, Apr. 27, 1976, 5718/76
Int. Cl.[2] G07F 3/02
U.S. Cl. 194—97 A 9 Claims

1. A device for providing a rim check of coins in coin selection apparatus which has discrete chutes within its body provided for the passage, respectively, of authentic and reject coins, said chutes having juxtaposed entrances, said device

comprising a cradle pivoted with respect to the body at a position above and adjacent to said entrances, and means for biasing said cradle to a rest position, said cradle including a frame, tongs having coin-gripping jaws at one end and being



pivoted with respect to the frame, and a carriage displaceably mounted on the frame and responding to the weight of a coin to impose a closing force on said jaws of the tongs to clamp them upon said coin and to cause the cradle to pivot to a coin discharge position while said jaws continue to grip said coin.

4,101,017

MATRIX PRINT HEAD

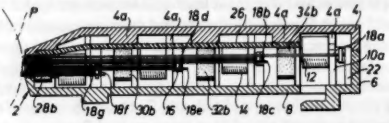
Gösta Roland Englund, Stockholm, and Karl Tommy Wincent, Upplands Väsby, both of Sweden, assignors to Svenska Dataregister Aktiebolag, Sweden

Filed Jun. 17, 1976, Ser. No. 697,299

Claims priority, application Sweden, Jun. 30, 1975, 7507469; Jan. 29, 1976, 7600963

Int. Cl.[2] B41J *3/04*

U.S. Cl. 400—124 **5 Claims**



1. A matrix print head comprising:

a plurality of electromagnets each having an associated armature;

each of said electromagnets including a pair of poles;

a plurality of elongated print elements having ends adapted for printing markings on a data carrier;

each of said print elements being associated with an armature;

said armature comprising a bar including first and second portions;

said armature being pivotable about said first pole at said first portion of said bar;

each of said print elements including an armature-engaging portion for resiliently maintaining its associated armature against its associated electromagnet;

said print element armature-engaging portion being in contact with each end of said bar;

one end of said bar being provided with a groove and the other end of said bar is provided with a hole;

said groove accommodating a first part of said armature-engaging portion and said hole accommodating a second part of said portion;

each of said print elements including a straight-line portion substantially perpendicular to said data carrier;

said print element straight line portions being parallel to each other and being disposed in the same plane;

each of said print element armature-engaging portions permitting its associated armature to pivot about a first one of said poles whenever said electromagnet is energized; whereby

the associated print element is thereby moved in a direction parallel to the straight-line portion thereof to thereby permit a marking on said data carrier to be printed.

4,101,018

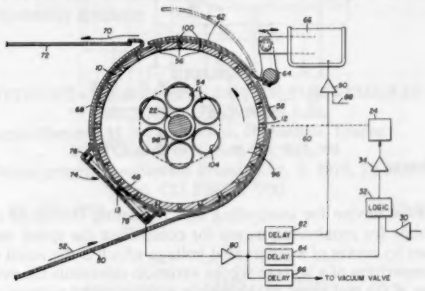
PAPER EDGE SENSOR

Eugene K. Sokolowski, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Continuation of Ser. No. 606,959, Aug. 22, 1975, abandoned. This application Mar. 1, 1977, Ser. No. 773,246

Int. Cl.[2] B41J *29/44;* **B41F** *13/00*

U.S. Cl. 400—582 **2 Claims**



1. In a printing apparatus, a rapidly-rotating drum for carrying a record medium having two edges repeatedly past a printing means which selectively prints indicia on the record medium, a system for initiating a cycle of operation of the printing apparatus at a consistent distance from a leading one of the two edges of the record medium, comprising:

means for holding the record medium to the drum with a trailing one of the two edges and a length of the record medium attached thereto extending in a tangential direction away from the drum;

means for sensing the passage of said trailing edge past a fixed position on the printing apparatus;

means for sensing incremental rotation of the drum;

delay means responsive to the sensing means for producing a signal a predetermined time interval after the sensing means senses the trailing edge of the record medium, the time interval related to the speed of rotation of the drum, the angular distance between the sensing means and the printing means, and the top margin of the record; and

logic means responsive to the signal produced by the delay means for starting the outpulsing of indicium-forming signals to the printing means and responsive to sensing of subsequent incremental rotation of the drum for outpulsing successive indicium forming signals to the printing means.

4,101,019

AERIAL CONVEYOR SYSTEM

Charles R. Satterwhite, 15920 Coolwood, Dallas, Tex. 75218

Continuation of Ser. No. 413,537, Nov. 7, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 620,929

Int. Cl.[2] B65G *63/00*

U.S. Cl. 198—300 **37 Claims**

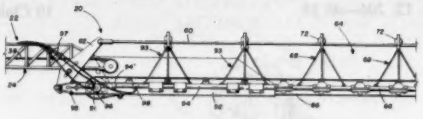
1. An aerial conveyor system comprising:

a cable extending from a material receiving zone over an open area to a material discharge zone;

a plurality of conveyor support frames each comprising a pair of elongate members extending substantially parallel to the cable, hook roller means for supporting the elongate members on the cable, and roller means supported by and extending transversely between the elongate members;

the conveyor support members engaging one another end to end to define a substantially continuous array extending from the receiving zone across the open area to the discharge zone;

an endless conveyor belt supported on the conveyor support rollers for movement around a course extending from the receiving zone over the open area to the discharge zone;



drive means mounted at the discharge zone end of the array of support members for driving the conveyor belt around the course;

said elongate members of the support frames being tubular and having the adjacent ends thereof connected in communication with one another; and

means extending through the tubular elongate members of the conveyor support frames from the receiving zone end of the array to the discharge zone end for supplying operating power to the drive means.

4,101,020

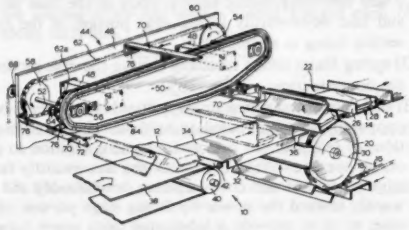
PACKAGING MACHINE TRANSFER MECHANISM

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed Mar. 1, 1977, Ser. No. 773,324

Int. Cl.[2] B65G *47/52*

U.S. Cl. 198—478 **6 Claims**



1. In a packaging machine having a load transfer station and a packaging station, the improvement of;

(a) a main conveyor mounted for continuous longitudinal movement through said load transfer station and said packaging station,

(b) a plurality of article receiving compartments carried by said main conveyor at longitudinally spaced intervals thereon, each of said compartments having a front wall and a back wall projecting outwardly from and longitudinally spaced with respect to said main conveyor, said compartments opening upwardly away from said main conveyor,

(c) a loading platform in said load transfer station and disposed in a transfer plane, said loading platform having a discharge edge at one end thereof,

(d) means for depositing articles onto said loading platform,

(e) discharge means associated with said loading platform for moving articles along said loading platform to discharge them over said discharge edge,

(f) means supporting said main conveyor to guide said article receiving compartments in a loading path which includes an arcuate section disposed adjacent to and below said loading platform and a straight section which extends forwardly from said arcuate section outwardly from said discharge edge such that the front wall of each compartment emerges from below said loading plane and projects upwardly in front of said discharge edge to form a stop against which articles are driven by said discharge means and thereafter said back wall emerges from below said loading plane to retain transferred articles in said article receiving compartment as the compartments are conveyed from said loading station along said straight section of said loading path for subsequent packaging,

(g) said discharge means being adapted to move articles along said platform at a speed which is greater than the speed of forward movement of said article receiving compartments as they emerge from below said discharge edge of said platform whereby the articles discharged thereby are urged into engagement with the front wall of the article receiving compartment in which they are located,

(h) said discharge means comprising a plurality of pusher blades mounted for movement along a path which includes a forward run which is disposed above said platform, said forward run including a transfer section projecting forwardly and inclined upwardly from adjacent said discharge edge of said platform whereby said pusher blades are elevated out of the path of the back wall of said compartments as the back wall emerges from below said platform,

(i) said pusher blades being mounted to pivot about an axis extending transversely of the longitudinal extent of said main conveyor and guide rail means coextensive with at least said transfer section of said forward run of said guide rail means cooperating with said pusher blades to cause said pusher blades to pivot rearwardly and upwardly away from said loading plane as the pusher blades move forwardly along said transfer section to direct an article forwardly and downwardly into an article receiving compartment, the pusher blades moving forwardly relative to a compartment after loading thereof to be disposed in an overlying relationship thereto thus ensuring that the article located in the compartment does not project excessively upwardly from said compartment.

4,101,021

APPARATUS FOR CONVEYING BULK MATERIALS

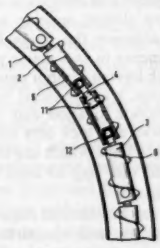
Walter Sauer, Aschaffenburg, Germany, assignor to Hans Giesbert KG, Mombris, Germany

Filed Jul. 23, 1976, Ser. No. 708,130

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 7528530[U]

Int. Cl.[2] B65G *33/16, 33/32*

U.S. Cl. 198—668 **1 Claim**



1. Apparatus for conveyance of feed for small animals comprising:

conveying chute means having curved sections therein,

motor-driven conveyor screw means disposed within said

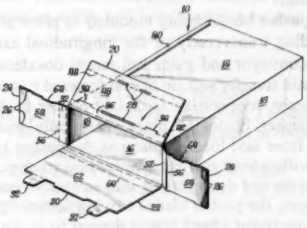
conveying chute means, said conveyor screw means comprising within said curved sections thereof:
(a) a plurality of individual screw segments,
(b) said screw segments each comprising a tubular section,
(c) said tubular sections each having a screw part outwardly disposed and integrally formed thereon,
(d) said screw segments being joined by elongated swivel pins mounted therebetween,
(e) said swivel pins comprising tapered and non-tapered sections,
(f) said non-tapered sections being located towards the ends of said swivel pins with said tapered sections located therebetween and tapering towards each other,
(g) said non-tapered sections having bores therein,
(h) stud means for joining said swivel pins to said tubular sections,
(i) said bores receiving said stud means and
(j) said tubular sections receiving said non-tapered sections of said swivel pins.

4,101,022

RECESSED END CONTAINER

Caesar E. Watkins, Carrollton, Tex., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Mar. 28, 1977, Ser. No. 781,643
Int. Cl.[2] B65D *5/10, 5/50*
U.S. Cl. 206—45.14 **2 Claims**



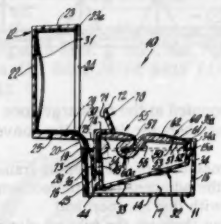
1. A package which includes an article disposed within a recessed end container, said container including
top, bottom and side walls joined to form a generally rectangular tubular compartment wherein said article is contained and closure means at each end of said compartment,
said closure means at one end of said compartment including top, bottom and side flaps hinged respectively to said top, bottom and side walls, wherein the improvement comprises
one of said top and bottom flaps having a first minor panel which extends into said compartment and which is hinged to a major panel that extends between said top and bottom walls at a location spaced interiorly of the end edge of said compartment, said major panel being hinged in turn to a second minor panel that extends to said end edge, said one flap also having slotted opening means in each of said minor panels adjacent the hinge lines with said major panel and slit means in said major panel,
said side flaps each having a minor panel which is folded into said compartment, a major panel lying adjacent said one flap at said interior location and extending toward the opposite side wall and lock tabs on the upper and lower edges of said side flaps which are received in said slotted openings in said one flap to hold said side flaps in the folded position,
the other of said top and bottom flaps having a minor panel which is folded into said compartment over said second minor panel and a major panel which lies adjacent said side flap major panels and extends between said top and bottom walls, thereby sandwiching said side flaps between said one flap and said other flap, said other flap major panel having fold tab means and having a lock tab formed at its end edge, said lock tab being received in said slotted opening means in said first minor panel of said one flap and said fold tab means extending past said side flaps and being received in said slit means in said major panel of said one flap to thereby hold said four flaps in closed position.

4,101,023

RING BOX WITH REMOVABLE DISPLAY STAND

Eric Schuander, South Orange, N.J., assignor to The Alsten Company, Jersey City, N.J.

Continuation-in-part of Ser. No. 777,930, Mar. 15, 1977, abandoned. This application Oct. 20, 1977, Ser. No. 844,044
Int. Cl.[2] B65D *1/34, 5/50*
U.S. Cl. 206—45.19 **10 Claims**



1. A box comprising:
(A) a case section, said case section including
(i) a bottom wall and
(ii) a peripheral wall, said peripheral wall extending upwardly and terminating in an upwardly facing edge portion,
(B) a cover section, said cover section including
(i) a top wall and
(ii) a peripheral wall, said peripheral wall extending downwardly and terminating in a downwardly facing edge portion,
(C) said upwardly facing edge portion of the case section and said downwardly facing edge portion of the cover section being in alignment,
(D) spring hinge means rotatably joining the case section to the cover section,
(E) said case and cover sections and said hinge means being cooperatively constructed to hold said facing edge portions of said sections disposed in spaced relation to each other, one above the other, with the downwardly facing edge portion of said cover slanting downwardly and forwardly toward the upwardly facing edge portion of the case, so as to provide a substantial open space between said facing edge portions when said cover section is swung down over said case section, and
(F) a removable separately displayable display stand, said display stand including
(i) a flange interposed between said case section and said cover section when the box is closed, said flange being of uniform height and being contacted by said facing edge portions and maintaining said edge portions in parallel spaced relation,
(ii) the outer sides of said flange being exposed to view externally of the box when the box is closed.

4,101,024

INDIVIDUAL, DISPOSABLE HOLDERS FOR CIGARETTES AND DISPENSERS THEREOF

Seiji Furuya, 151 N. Alvarado Ave., Ojai, Calif. 93023, and Roger H. Smartt, 77 Hackberry Dr., Ventura, Calif. 93001

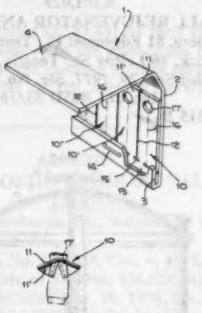
Filed Jul. 26, 1976, Ser. No. 708,582
Int. Cl.[2] A24F *13/08, 13/22*
U.S. Cl. 206—102 **1 Claim**

1. As an article of manufacture, an array of a plurality of

individually separable disposable holder elements particularly adapted for smoking a short stub of a cigarette not provided with a mouthpiece and usually have an irregularly shaped, virtually conical end,

said array being formed from a body of planar sheet material provided with a plurality of transversely spaced, parallel, longitudinal slits separating individual holder elements extending from a transversely extending, unslit tab portion and a line of perforations adapted to facilitate separation of individual holder elements from said tab portion,

each of said individual holder elements having means, at a zone removed from said tab portion, integral with said



sheet material for receiving, holding and embracing the stub end of a cigarette with its axis virtually at right angles to the holder element, each holder element of said array being provided with a longitudinally extending medial score line to facilitate folding therealong, and each of the holding means comprising an aperture intersecting said medial score line adjacent the end of the holder element removed from the tab portion, said aperture being adapted to receive, grasp and hold an irregularly shaped end of a cigarette guided to said aperture by a trough formed by portions of the holder element on opposite, lateral sides of the medial score line partly folded toward each other along such line.

4,101,025

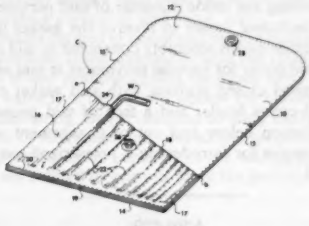
CARRYING CASE FOR WRENCHES

Ronald H. Jordan, 530 Hamilton St., Burlington, N.C. 27215

Filed Jul. 8, 1977, Ser. No. 813,875

Int. Cl.[2] B65D *85/20*

U.S. Cl. 206—377 **1 Claim**



1. A case for hexagonal bar wrenches comprising:

(a) a backing member formed of leather material and generally rectangular in shape, having a bottom edge, side edge, and an upper edge;

(b) a separate cover member also formed of leather material and in the shape of a right trapezoid, three sides of said cover member, when assembled, lying coextensively with three corresponding sides of backing member throughout a portion of the periphery of said backing member and the fourth side extending across the surface of said backing member between said side edges from a first point on one side edge spaced above said bottom edge a first distance to a second point on the other side edge spaced above said bottom edge a second, smaller distance;

(c) said cover member being stitched to said backing member with a sturdy thread around the coextensive sides and across the bottom, and a plurality of spaced parallel lines of stitches connecting said cover and said backing member, said lines of stitches extending from said fourth side downwardly toward said bottom edge forming a plurality of pockets therein; and

(d) a snap connecting means having a male member secured to said cover member at a point centrally located and slightly below said fourth edge, and a female member secured to said backing member at a point centrally located between said side edges and slightly below said upper edge whereby the top portion of said backing member may be folded over and releasably secured to said male member covering the wrenches inserted in said pockets.

4,101,026

PRE-MOISTENED TOWELETTE DISPENSER

Joseph P. Bonk, Des Plaines, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 405,503, Oct. 11, 1973, Pat. No. 3,986,479.

This application Apr. 26, 1976, Ser. No. 680,607

Int. Cl.[2] B65D *81/24*

U.S. Cl. 206—205 **1 Claim**

1. A pre-moistened towelette roll assembly comprising:

(a) a substantially water impervious sealed pouch,

(b) a roll of a web of absorbent material, disposed in said pouch, said web having lines of perforations disposed spaced apart longitudinally along said web to define individual towelettes when severed from said web,

(c) a leader of non-absorbent material attached at one end to said web within said pouch for withdrawing web from said roll and for threading said web in a dispenser adapted to receive said assembly, and said leader having a portion extending exteriorly of an outer margin of said pouch, a portion of said pouch margin being sealed to said leader to prevent vapor loss from said fluid yet said margin still being removable from said leader,

(d) a chemical-containing fluid impregnated in said absorbent material, and

(e) said fluid is an amount sufficient to be retained by said absorbent material and maintain said web in a premoistened state under normal use conditions without free fluid in said pouch.

4,101,027

MAGAZINE FOR A PLURALITY OF RECORDING MEDIA

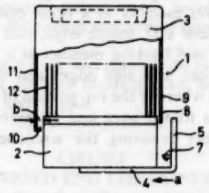
Lambert Kohl, Wachenheim; Richard Schneider, Heidelberg-Neuenheim, and Karl Uhl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,405

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612854

Int. Cl.[2] G11B *5/48*; B65D *85/30*

U.S. Cl. 206—309 **5 Claims**



1. A storage magazine for use in a record-changing device for recording and/or playing back information on a selected one of a plurality of flexible magnetic recording disks individually housed in respective ones of a plurality of flat rectangular cartridges, said device having a carriage supported therein for movement between a loading position and an operative, cartridge withdrawal position;

said storage magazine comprising:

a substantially cuboid tray with compartments receiving said plurality of cartridges, a removable hood cooperating with said tray to protect the cartridges therein while in storage, and a releasable locking mechanism between said tray and said hood, said tray having guide means for loading said tray with said cartridges therein, and with said hood removed, onto said carriage preparatory to selective withdrawal of said cartridges in said operative position of the carriage, the bottom of said tray having externally attached thereto a substantially L-shaped member, the horizontal arm of said member forming said guide means while the verticle arm of said member extends in spaced relation to the corresponding side wall of the tray to form a handle for laterally moving said tray.

4,101,028

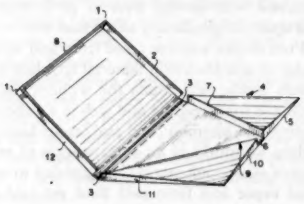
HERB CLEANER RECORD COVER

Marc Anthony Cantil Woolbright, 3927 Y St., Sacramento, Calif. 95817

Filed Nov. 1, 1976, Ser. No. 737,790

Int. Cl.[2] B65D *85/30*

U.S. Cl. 206—311 **2 Claims**



1. In a double album record cover having two halves connected by a spine, the improvement comprising:

(a) one of said halves being formed with edge walls on the three edges of said half not adjacent said spine projecting normal to the plane of said one half and;

(b) the other of said halves having formed thereon a pair of converging walls forming a sorting device, said converging walls forming therebetween a converging sorting cavity having a wide end and a narrow end, the narrow end forming an exit opening, said wide end of said cavity being located at the edge of said other half adjacent said spine and the exit opening being located at the edge of said other half opposite said spine, said exit opening being less than 2¾ inches wide, whereby when said album is folded, said one half and said edge walls confine and enclose said sorting cavity, and said other half.

4,101,029

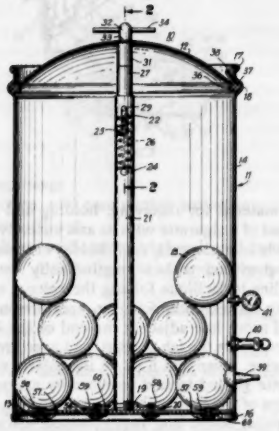
TENNIS BALL REJUVENATOR AND MAINTAINER

Robert S. Feinberg, 81 Edgemont Pl., Teaneck, N.J. 07066, and David A. Selick, 76 LeRoy St., Tenafly, N.J. 07670

Filed Sep. 29, 1977, Ser. No. 837,783

Int. Cl.[2] B65D *85/16*

U.S. Cl. 206—315 B **12 Claims**



1. A pressure vessel comprising an open topped cylindrical receptacle including a bottom wall and an upstanding peripheral wall having a peripheral groove formed in the inside face of its upper border, a compressible annular gasket removably engaging said peripheral groove and projecting inwardly of the inside face of said peripheral wall, a circular cover member having a depending outwardly inclined peripheral border with an outer diameter less than the outside diameter of said gasket and not exceeding the inside diameter of said peripheral wall, said border including means to receive the gasket in sealing relationship guide means separably connected to said cover for supporting said cover for vertical movement in said receptacle between a raised closed position with said gasket embraced between said cover border and a face of said groove and a depressed position below and out of engagement with said gasket, and means for introducing a pressurized gas into the closed vessel.

4,101,030

CASSETTE

Wilhelm Kroeber, 3 Ellerbookwisch, Hamburg 2000, Fed. Rep. of Germany (65)

Filed Jun. 3, 1977, Ser. No. 803,066

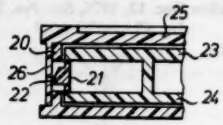
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624880

Int. Cl.[2] B65D *85/672*

U.S. Cl. 206—398 **5 Claims**

1. A cassette and associated spool for film, recording tape, and similar material and a means for supporting the outer areas

of the spool flanges characterized in that areas (**21,31, 41,42**) of the side wall (**20,30,40**) of the base of the cassette corresponding in height substantially to the spacing between adjacent sides of the spool flanges (**23,24**) are arranged to be resiliently and radially displaceable in relation to the other wall areas and



provided with projections (**22,32,43**) on their outer sides and including means responsive to the application of the cassette lid (**25**) to the base of the cassette so that said areas will be pressed into the inside of the cassette between the spool flanges.

4,101,031

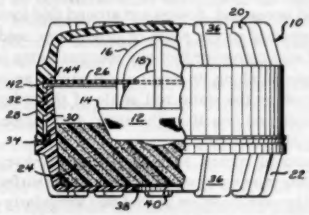
PACKAGE FOR PROSTHETIC HEART VALVE OR THE LIKE

Harry W. Cromie, Pittsburgh, Pa., assignor to Medical Engineering Corp., Racine, Wis.

Continuation of Ser. No. 620,238, Oct. 6, 1975, abandoned, which is a continuation of Ser. No. 464,021, Apr. 25, 1974, abandoned. This application Dec. 16, 1976, Ser. No. 751,614

Int. Cl.[2] **B65D** *81/06, 85/30*

U.S. Cl. 206—438 **6 Claims**



1. In a package for prosthetic heart valve and the like comprising a pair of separable, mating package sections for receiving said heart valve, and retaining said valve in sterile manner in biased position against a resilient pad carried by one of said package sections, the improvement comprising:

(a) a separate retainer member positioned within said package for biasing said heart valve against the resilient pad, said retainer being a rigid sheet having an aperture shaped to receive a portion of said valve, and

(b) a shoulder defined in one of said mating package sections, said shoulder being adapted to urge the retainer member into a biased position against the heart valve so that the heart valve is in turn biased against the resilient pad, said shoulder being further adapted to slide easily along the surface of the retainer member so that torque is not transmitted to the heart valve when the mating package sections are rotated to open or close the package.

4,101,032

ORNAMENTAL ARTICLE FOR PACKAGES OR THE LIKE

Andy Obidniak, Ville la Salle, Canada, assignor to H & F Faller Sales Corp. Ltd., Montreal, Canada

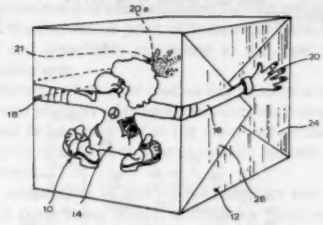
Filed Jan. 21, 1976, Ser. No. 651,198

Claims priority, application Canada, Jan. 22, 1975, 218456

Int. Cl.[2] **B65D** *63/10*

U.S. Cl. 206—457 **3 Claims**

1. In combination with a three-dimensional package of predetermined size, an ornamental affixative article of size smaller than the package, said ornamental article comprising a blank of pliable sheet material a front and rear face and a shaped peripheral edge which outlines an animated character having a central body from each side of which extends a relatively narrow and elongated appendage of oversized arm length and terminating in enlarged hands, said blank having its front face pro-



vided with indicia representative of said animated character and its rear face at least in the region of said hands provided with the adhesive for affixing the animated character to said package, said blank being fitted snugly against said package with its rear face in contact with the surface thereof and with the body portion and the oversized arm lengths fully extended to envelope the package along at least two of its surfaces.

4,101,033

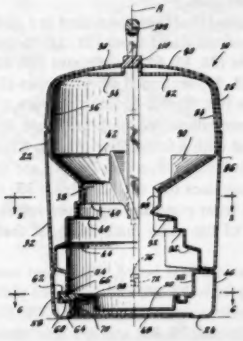
MOLDED CASE FOR SUPPORTING AND ENCLOSING AN ARTICLE

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Jun. 8, 1977, Ser. No. 804,504

Int. Cl.[2] **B65D** *85/30*

U.S. Cl. 206—521 **20 Claims**



1. A molded case, formed to support and enclose an article having a base, said case comprising:

A. a main body member having an interior wall shaped to generally conform to a portion of the article and having at least one inwardly projecting structure;

B. a base member formed with:

1. an upstanding interior wall that complements said interior wall of said main body member and

2. a floor recessed from said upstanding interior wall and shaped to receive the base of the article;

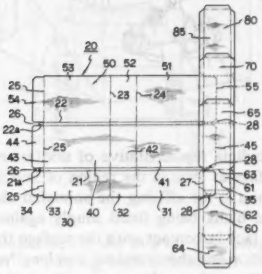
C. means for securing said base member to said main body member; and

D. a closure member, hinged to said main body member for movement between closed and open positions, formed with an interior wall which generally extends from said base member upstanding wall and complements said main body member interior wall when in the closed position.

4,101,034
PACKING BOX

Akio Yamaguchi, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,823
Claims priority, application Japan, Sep. 13, 1976, 51-123096[U]
Int. Cl.² B65D 5/54, 17/24
U.S. Cl. 206—612 12 Claims



1. A packing box, comprising:

a base board (**20**) made of corrugated cardboard on which a plurality of cut tapes (**21, 22**) are provided parallel at a predetermined spacing on the inside surface of said board to section said base board in its width direction into a number of sections;

two bending lines (**23, 24**) are provided in a direction rectangularly intersecting said tapes (**21, 22**) to form continued bottom plates (**31, 41, 51**), rear plates (**32, 42, 52**), and lid plates (**33, 43, 53**) sectioned by said tapes (**21, 22**);

auxiliary plates (**60, 70, 80**) equal in number to said number of sections are connected with said base board, are provided at least with a front plate (**61, 71, 81**) and right (**65, 75, 85**) and left side plates (**64, 74, 84**), are made bendable along bending lines (**62, 63, 72, 73, 82, 83**) on the boundaries of said front plate and right and left side plates, and are formed of the same material as of that of said base board (**20**);

whereby when said base board (**20**) is bent inside along said two bending lines (**23, 24**) and said front plates (**61, 71, 81**) of said respective auxiliary plates (**60, 70, 80**) are erected, and said right (**65, 75, 85**) and left side plates (**64, 74, 84**) are bent and are connected with the respective sections of the bottom plate, a plurality of sectioned box-shaped parts (**36, 46, 56**) are formed on a common bottom plate;

said box-shaped parts (**36, 46, 56**) are opened and closed with a common lid continued with the bottom plate and rear plate;

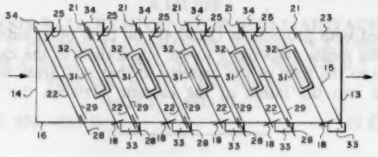
said lid is peeled off and broken in the forward and rearward direction for the respective sections by pulling grippable parts (**21***a*, **22***a*) of said tapes (**21, 22**) in the end parts of said lids; and

lids (**33, 43, 53**) opening and closing independently for the respective sections are formed and said rear plates and bottom plates are peeled off and broken in the forward and rearward direction for said respective box-shaped parts (**36, 46, 56**) by selectively peeling off said tapes (**21, 22**) so that said respective box-shaped parts (**36, 46, 56**) may be divided into independent boxes (**92, 93, 94**) of smaller units.

4,101,035
CONVEYOR BELT SOLIDS SEPARATOR WITH COMBINED SCRAPER AND GAS JET CONTROL

Edward D. Burger, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 749,587, Dec. 10, 1976. This application Dec. 13, 1976, Ser. No. 750,072
Int. Cl.² B07C 1/00
U.S. Cl. 209—114 42 Claims



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which tend to slide down an inclined surface comprising:

a. a conveyor belt-like member having an upper surface, an upper end and a lower end and adapted to rotate about said upper end and said lower end in a manner such that a point on said conveyor belt-like member cycles upward around said upper end, downward around said lower end, and then upward to the point of origination, said upper surface of said conveyor belt-like member being inclined from horizontal along its longitudinal axis at an angle at least as great as the static roll angle of the spherically-shaped solids and less than the static slide angle of the irregularly-shaped solids;

b. upper removal means adapted to deflect irregularly-shaped solids moving upward on said upper surface in an upward, sideways direction so that said irregularly-shaped solids move off a side of said conveyor belt-like member;

c. first receiving means adapted to receive irregularly-shaped solids deflected off said inclined conveyor belt-like member by said upper removal means;

d. lower removal means spaced along the longitudinal axis of said conveyor belt-like member from and below said upper removal means, said lower removal means having an upper side adapted to deflect spherically-shaped solids moving downward on said upper surface in a downward, sideways direction so that said spherically-shaped solids move off a side of said conveyor belt-like member;

e. second receiving means adapted to receive spherically-shaped solids deflected off said inclined conveyor belt-like member by said second removal means;

f. longitudinal gas control means adapted to emit jets of gas directed angularly and longitudinally to a target area extending over a major portion of the width of said upper surface, said target area being upward and ahead of said upper side of said lower removal means by a preselected distance, said preselected distance being such that at least one row of spherically-shaped solids adjacent said upper side of said lower removal means is outside said target area of said jets of gas, said jets of gas being of sufficient force to affect the downward movement of spherically-shaped solids in said target area on said upper surface; and

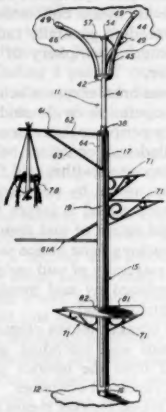
g. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto a portion of said upper surface between said upper removal means and said target area of said longitudinal gas control means.

4,101,036

SUPPORT COLUMN WITH CEILING THRUSTERS

Paul M. Craig, 858 Lomita St., El Segundo, Calif. 90245

Filed Jan. 14, 1977, Ser. No. 759,253
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—86 1 Claim



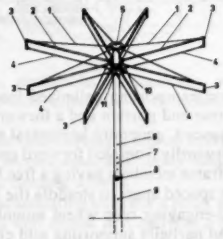
1. A support pole for placement between floor and ceiling and comprising a hollow column, a floor pad at an end of the column, an adjustable shaft movable at the other end of the column, resilient means biasing the shaft relative to the column, a plurality of thrust arms adapted to thrust against said ceiling to secure said thrust arms with respect to said ceiling; articulated means securing the thrust arms to the outer end of said shaft to diverge therefrom uniformly, said articulated means including a support assembly at the end of the adjustable shaft remote from the column, a support post extending from the support assembly, a pivot securing each thrust arm for articulation to the support assembly, and a tie extending from the post to each thrust arm intermediate the length of the thrust arm; a plurality of independent fastening bands fixed to the exterior of the column, and at least one cantilever support adapted to engage a fastener band and extend away from the column.

4,101,037

FOLDABLE ROTARY CLOTHES HOIST

Ernst Allesch, 56 Port Arthur St., Lyons, Canberra, Australia 2606, and Nathan Bank, 18 McCormack St., Curtin, Canberra, Australia 2605

Filed Dec. 13, 1976, Ser. No. 751,063
Claims priority, application Australia, Oct. 19, 1976, 7785/76
Int. Cl.[2] A47F 5/02
U.S. Cl. 211—167 8 Claims



1. A foldable rotary clothes hoist comprising:

(i) An upright support post rotatably mounted in a socket on a base member;

(ii) A plurality of arms, each connected at one end to said post and extending radially outwardly thereform; each of said plurality of arms being capable of upward and downward movement independently from the other arms;

(iii) A plurality of tension members, each associated with a respective arm and being connected at one end to said post above the connection point of its associated arm and at the other end detachably connected to the distal end of a respective arm;

(iv) A plurality of separate clothes line sections independent from said plurality of tension members, each connected at one end to said post and at the other end connected to a respective arm so as to extend radially beneath a respective arm;

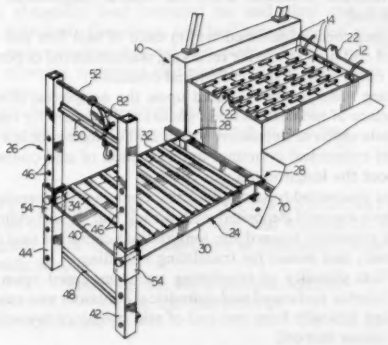
(v) The connections of said tension members and said arms to said posts being pivotal and having pivot axes transverse to the longitudinal axis of said post whereby on detaching said tension members from said arms, said tension members, arms and clothes line sections are able to fold downwardly to lie alongside said post.

4,101,038

SERVICE RACK FOR LIFT TRUCKS

Milton J. Palma, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 2, 1977, Ser. No. 802,613
Int. Cl.[2] B65G 67/24
U.S. Cl. 214—44 R 8 Claims



1. A service rack for use in removing and thereafter supporting heavy objects from a place of installation to permit access to other, underlying objects at the place of installation, said rack comprising:

a support bed having opposed ends and including a pair of spaced apart side rails;

a plurality of rollers journalled between said rails along the length thereof and having peripheries extending past one edge of each of the rails on at least one side of said bed, the axes of rotation of said rollers being generally transverse to said side rails;

an elongated leg structure;

means for selectively securing an end of said support bed to said leg structure at a desired one of a plurality of positions along the length of said leg structure such that said leg structure will be generally transverse to said support bed;

gripper means at the other end of said support bed for securing said other end, in elevated relation, to structure at a place of installation; and

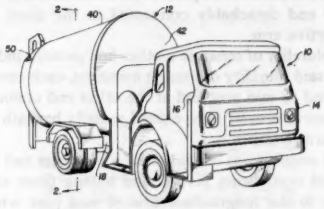
winch means mounted on said leg structure.

4,101,039

APPARATUS FOR COLLECTING AND COMPACTING WASTE MATERIAL

Pier F. Talenti, Washington, D.C., assignor to Orbital Collection Systems, Inc., Washington, D.C.

Filed Jan. 25, 1977, Ser. No. 762,601
Int. Cl.[2] B60P *1/42*
U.S. Cl. 214—83.32 **6 Claims**



1. An apparatus for collecting and compacting waste material comprising:

a hollow cylindrical container operable to be mounted upon a truck chassis for selective rotation about the longitudinal axis of said cylindrical container;

first end wall means operable to be mounted upon the truck chassis and being positioned across one end of said cylindrical container;

second end wall means operable to be mounted upon the truck chassis and being positioned across the other end of said cylindrical container;

means mounted upon said truck chassis and connected to said cylindrical container for selectively rotating said cylindrical container about the central longitudinal axis thereof;

charging means fashioned within each of said first and second end wall means for receiving waste material deposited at either end of said cylindrical container;

packing vane means mounted upon the peripheral interior surface of each end of said cylindrical container for raising waste material deposited within said charging means into said cylindrical container upon rotation of said container about the longitudinal axis thereof;

means connected to said cylindrical container for translating waste material deposited within each end of said cylindrical container toward the longitudinal center of said container, said means for translating including

a first plurality of translating vanes mounted upon the interior surface of said cylindrical container and extending helically from one end of said container toward the center thereof;

a second plurality of translating vanes mounted upon the interior surface of said cylindrical container and extending helically from the other end of said container toward the center thereof;

first discoid means rotatively mounted upon one end wall of said cylindrical container and being directed generally inwardly and upwardly toward the central portion of said container,

said first discoid means having generally radially extending vanes thereon and being mounted adjacent the charging means of said one end wall for contacting waste material delivered into the interior of said container and for directing said waste material toward the central portion of said container;

second discoid means rotatively upon the other end wall of said cylindrical container and being directed generally inwardly and upwardly toward the central portion of said container;

said second discoid means having generally radially extending vanes thereon and being mounted adjacent the charging means of said othe end wall for contacting waste material delivered into the interior of said container and for directing said waste material toward the central portion of said container;

wherein waste material deposited within said charging means at either end of said cylindrical container will be directed generally toward the center of said container by said first and second discoid element to tightly compact waste material within said cylindrical container; and

first spring biased breaker means connected to said first end wall means and extending generally radially toward but spaced from the interior periphery of said one of said cylindrical container,

said first spring biased breaker means being operable to act in opposing cooperation with said packing vanes mounted upon the peripheral interior surface of said one end of said cylindrical container wherein oversized waste material deposited within said first end charging means will be first raised by said packing vane means and if said waste material is larger than the passage between the radial extent of said spring biased breaker means and said packing vane means said waste material will contact the extremity of said spring biased breaker means and be reduced by said breaker means before entering said container; and

second spring biased breaker means connected to said second end wall means and extending generally radially toward but spaced from the interior periphery of said other end of said cylindrical container,

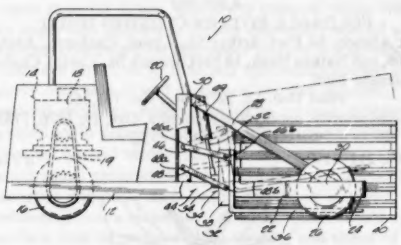
said second spring biased breaker means being operable to act in opposing cooperation with said packing vanes mounted upon the peripheral interior surface of said other end of said cylindrical container wherein oversized waste material deposited within said second end charging means will be first raised by said packing vane means and if said waste material is larger than the passage between the radial extent of said spring biased breaker means and said packing vane means said waste material will contact the extremity of said spring biased breaker means and be reduced by said breaker means before entering said container.

4,101,040

VEHICLE FOR TRANSPORTING PALLETIZED LOADS

Ronald M. Stolley, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 13, 1977, Ser. No. 796,804
Int. Cl.[2] E02F *3/00*
U.S. Cl. 214—131 R **4 Claims**



1. A vehicle for transporting palletized loads comprising a chassis having a rear end portion and a forward end portion, a pair of laterally spaced, generally horizontal side frame members extending forwardly from said forward end portion of said chassis, said side frame members having a free forward end and being sufficiently spaced apart to straddle the load to be transported, a ground-engaging rear wheel mounted on said rear end portion of and partially supporting said chassis, a ground-engaging wheel mounted on each of said side frame members near said free end thereof and supporting said side frame members in spaced relationship to the ground, a load-lifting frame

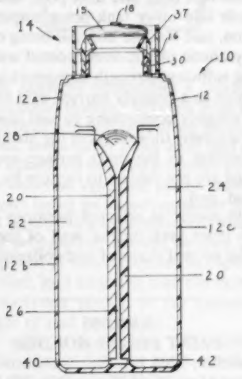
adapted to lift and carry a palletized load disposed between said side frame members, a linkage arrangement connecting said load-lifting frame to said chassis for movement of said load-lifting frame relative to said chassis between a lowered position for picking up the load and a raised position to lift the load for transporting to another location, said linkage arrangement being automatically operative to tilt said load-lifting frame rearwardly relative to said chassis as said load-lifting frame is moved from the lowered position toward the raised position and including a pair of vertically spaced upper and lower rigid links, said upper link having a first end pivotally connected to said chassis about a first axis fixed relative to said chassis and said upper link and having a second end pivotally connected to said load-lifting frame about a second axis fixed relative to said load-lifting frame and said upper link, said lower link having a first end pivotally connected to said chassis about an axis fixed relative to said chassis and said lower link and located directly vertically below said first axis, said lower link also having a second end pivotally connected to said load-lifting frame about an axis fixed relative to said load-lifting frame and said lower link and located directly vertically below said second axis when said load-lifting frame is in the lowered position, the distance between the pivotal connections of said upper link being less than the distance between the pivotal connections of said lower link, and lift means connected between said chassis and said load-lifting frame for moving said load-lifting frame between the lowered and raised positions.

4,101,041

PREFILLABLE, HERMETICALLY SEALED CONTAINER ADAPTED FOR USE WITH A HUMIDIFIER OR NEBULIZER HEAD

Charles L. Mauro, Jr., New York, N.Y.; Theodore L. Siuta, Elizabeth, N.J., and Gordon Sylvester, Jamaica, N.Y., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Aug. 1, 1977, Ser. No. 820,641
Int. Cl.[2] B65D *1/02*
U.S. Cl. 215—6 **6 Claims**



1. A unitary, prefillable, hermetically sealed, container adapted for use with a humidifier or nebulizer head, which comprises;

a thermoplastic body having a closed first end and a closed removable second end, said body defining an interior chamber for holding a fluid;

a conduit communicating between a point within said chamber adjacent said closed first end and a point within said chamber adjacent said closed second end, said conduit having a guide means for receiving a tube at the point adjacent said second end;

support means for said conduit connected to said body; and

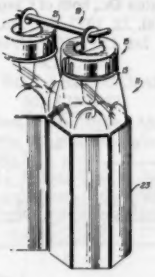
means for attaching a humidifier or nebulizer head to said body upon removal of said closed, removable second end.

4,101,042

BOTTLE DISC

Lawrence M. Strong, Solon, and Chester H. Rilling, Ravenna, both of Ohio, assignors to Questor Corporation, Toledo, Ohio

Filed Jul. 5, 1977, Ser. No. 812,648
Int. Cl.[2] A61J *9/06*
U.S. Cl. 215—11 R **3 Claims**



1. A disc for use with a baby bottle and a cap having an aperture therein, said disc comprising

a substantially planar base having a diameter smaller than the diameter of the interior of said cap;

a circular plate mounted on said planar base, said plate being of a dimension to mate within said aperture in said cap;

an elongated land mounted on said plate and extending outwardly therefrom, said land being tapered at each end and extending beyond said plate whereby said land removably maintains said plate within said aperture in said cap;

a tab having an aperture therethrough; and

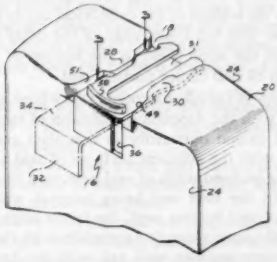
a flexible hinge connecting said tab to said land.

4,101,043

CONTAINER AND SUPPORT CLIP COMBINATION

Joseph E. Johnson, Jr., East Lyme, and Richard D. Warrell, Mystic, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,255
Int. Cl.[2] B65D *25/22*
U.S. Cl. 215—100 R **5 Claims**



1. In the combination of a container and an L-shaped support clip operable in a recess in the container base, the improvement wherein said clip comprises:

(a) an upright portion substantially parallel to the container axis; and

(b) a forked base portion slidable in the recess between first and second positions at which the upright member is

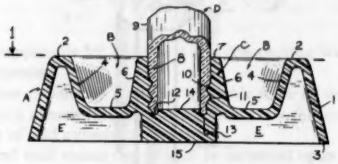
respectively displaced outwardly of and substantially in surface engagement with a sidewall of such container, the bifurcations of said forked member and the walls of such recess having means to lock the clip in place in said first position.

4,101,044

CLOSURE CAP AND SUPPORT FOR HOLDING A BOTTLE OF CARBONATED BEVERAGE IN INVERTED POSITION

Francis A. Paquette, 4308 Shamrock Way, and Richard H. Henze, 17647 Trenton Dr., both of Castro Valley, Calif. 94546

Filed Jul. 22, 1977, Ser. No. 818,001
Int. Cl.[2] B65D *47/40*
U.S. Cl. 215—228 **1 Claim**



1. A closure cap and support for holding a bottle of a carbonated beverage in an inverted position: comprising

(a) a single molded unit with a large area base substantially greater than the large diameter of the bottle, said base being defined by an outer annular wall extending upwardly and inclined inwardly from a planar surface and extending to a juncture with an inner annular wall that slopes downwardly and inwardly to form an inverted V cross sectional configuration;

(b) the lower end of said inner annular wall terminating and forming an integral connection with a horizontal bottom wall that is spaced above the aforementioned planar surface;

(c) said base having a center portion integral with said bottom wall and having a central cylindrical internally threaded cavity for receiving the exteriorily threaded neck of a bottle containing a carbonated beverage, the axis of said cylindrical cavity coinciding with the axis of said base and being normal to the planar surface, the bottom of the cylindrical cavity lying substantially in the same plane as that of said bottom wall and the top of said center portion lying substantially in the same plane as the plane coinciding with the junction of said inner and outer annular walls;

(d) said center portion having an integral extension extending from the bottom of the cylindrical cavity to the planar surface so that the lower edge of the outer annular wall will lie in the same plane as the bottom of said integral extension of said center portion; and

(e) a plurality of radially extending ribs whose inner ends are integral with the depending extension of said center portion and extend outwardly so that their outer ends are integral with the adjacent surfaces of said annular outer and inner inclined walls of said base, said ribs also adding weight to the base and being integral with the under surface of said bottom wall, the lower edges of said ribs lying in the same plane that coincides with the lower edge of said outer annular wall and with the bottom of said extension of said center portion;

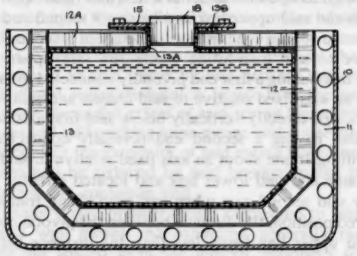
(f) whereby the center of gravity for the uncapped inverted bottle supported by said base will lie at the center of said depending extension of said center portion and the center portion will cooperate with the annular inner wall and with the bottom wall to form a circular reservoir for receiving any leakage from the inverted bottle, the threaded cavity forming a liquid seal for the contents of the inverted uncapped bottle; said ribs adding weight and structural reinforcement for the various parts of said base.

4,101,045

CRYOGENIC CONTAINER

William Melchior Roberts, Blauvelt, and Jean Kohn, New York, both of N.Y., assignors to Baltek Corporation, Northvale, N.J.

Filed Apr. 12, 1977, Ser. No. 786,878
Int. Cl.[2] B65D *87/24*; B63B *25/16*
U.S. Cl. 220—404 **13 Claims**



1. A cryogenic container for storing or shipping a liquified gas, such as LNG, at atmospheric pressure, in quantities comparable to those carried by LNG containers designed for transoceanic transport, said container comprising:

A. an enclosed rigid outer tank having structural walls which afford thermal insulation and incorporate a nonmetallic secondary liquid and gas-impervious barrier, the inner surface of the outer tank having a predetermined configuration, the top wall of said outer tank having an inlet port;

B. an independent tank for containing a load of liquified gas and constituted by a collapsible bladder of flexible material which may be lowered in the collapsed state into the rigid outer tank through said port and which includes a neck portion that lines said inlet port, said bladder when lowered into said outer tank being suspended from said neck portion, said bladder material being constituted by a fabric of synthetic plastic fibers coated with a compatible film having sufficient strength to support said liquified gas and operative as a primary barrier, said bladder having a geometry roughly conforming to said inner surface configuration whereby those areas of the bladder which fail to exactly conform to the inner surface and are therefore unsupported are not subject to rupture by forces imposed by said load, and

C. detachable means at selected positions to anchor said collapsible inner tank on the wall of the outer tank to maintain the normal shape of said collapsible tank when it is empty.

4,101,046

PAINT BRUSH HOLDER

Theodore F. Puntillo, 5706 28th St., Sacramento, Calif. 95824

Filed Mar. 31, 1977, Ser. No. 783,512
Int. Cl.[2] A46B *17/02*; B44D *3/12*
U.S. Cl. 220—90 **4 Claims**

1. A paint brush holder comprising a wide base element provided with a dependent lip-shaped portion complemental to a chime of a paint can arranged for association therewith, said chime having a circumference, a wide upstanding cradle means including an upper terminal portion and a planar portion offset from a juncture with said base element at an acute angle with respect thereto, the juncture of said cradle means with said base element being provided with a flat edge portion against which a paint brush may be moved in an upward direction for removing excess pain therefrom, and retention means for releasably holding said paint brush spaced from said edge portion

secured to said upper terminal portion of said cradle means, said dependent lip-shaped portion of said base element circumscribing an arc at the least of substantially one-third of the circumference of the chime of said paint can.

4,101,047

LAMINATED MATERIAL OF THERMOPLASTIC SYNTHETIC MATERIAL, PROCESS OF MAKING AND CONTAINER CLOSED THEREWITH

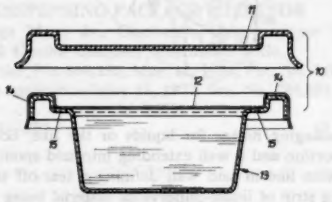
Barbara Geppert, and Kurt Huth, both of Wiesbaden, Fed. Rep. of Germany, assignors to Bellaplast GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 18, 1976, Ser. No. 715,219

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537435

Int. Cl.[2] B65D *5/64;* B29F *3/10;* B29C *19/00;* B32B *27/08*

U.S. Cl. 220—258 6 Claims



1. A container assembly comprising a cup-shaped body of synthetic thermoplastic material selected from the group consisting of polyethylene and polypropylene having a rim around its upper open end, and a cover fitted upon said rim, said cover comprising two adhesively bonded mutually detachable coextensive layers of different synthetic plastic materials, with the outer of said layers being an impact resistant polystyrene and the inner of said layers being of substantially the same material as said body and permanently bonded directly to said rim and containing a dispersal of adhesive material capable of bonding said layers together, said adhesive material being an ethylene vinyl acetate copolymer present in the amount of about 10 percent by weight of said inner layer.

2. Laminated material comprising two surface contacting coextensive layers of extruded heat bonded different synthetic thermoplastic materials that normally do not adhere to each other, one of said layers being a material selected from the group consisting of polyethylene and polypropylene, and the other of said layers being a material selected from the group consisting of polystyrene styrene-acrylonitrile copolymers and polycarbonates, at least one of said layers containing a dispersed predetermined quantity of adhesive material dispersed therein, said adhesive material being characterized in that it is capable of bonding said layers together and that it is present in such controlled quantity as to provide a bond of predetermined strength between said layers, the quantity of the adhesive material admixed to the material of at least one of the layers which are to be bonded together being within the range of between about 5 percent by weight and 50 percent by weight of the material of that one layer as a function of the desired adhesive bond strength between the layers.

5. A process for producing laminated material wherein two coextensive layers of different synthetic thermoplastic materials that normally do not adhere to each other are extruded in surface contact and heat bonded, characterized in that prior to extrusion a predetermined quantity of a selected adhesive material capable of bonding said materials together is dispersed within at least one of said layers, the quantity of the adhesive material dispersed in said one of the layers being within the range of about 5 to 50 percent by weight of that one layer as a function of the desired adhesive bond strength between the layers.

4,101,048

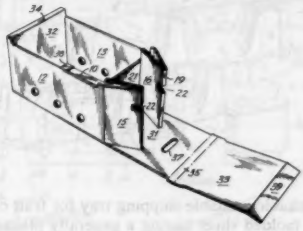
PRODUCE FIELD BOX AND FOLDABLE BLANK FOR MAKING IT

Horace Johnnie Rieben, Russellville, Ak., and Lawrence F. Taylor, Bay Minnette, Ala., assignors to International Paper Company, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,844

Int. Cl.[2] B65D *5/22, 21/02*

U.S. Cl. 229—34 R 20 Claims



1. A cut and scored foldable blank for a produce field box, which comprises:

a bottom panel;

first and second outside end wall panels connected to opposite sides of the bottom panel;

a first inside end wall panel, said first inside end wall panel connected by a first end wall top deck panel to said first outside end wall panel;

a second inside end wall panel, said inside end wall panel connected by a second end wall top deck panel to said second outside end wall panel;

first and second outside side wall panels connected to opposite sides of the bottom panel, wherein the corners of the first and second outside side wall panels which are remote from the bottom panel project away from said bottom panel whereby said corners of the first and second outside side wall help to support the first and second end wall top deck panels when the blank is folded into a produce field box;

a first inside side wall panel, said first inside side wall panel connected to said first outside side wall panel opposite to said bottom panel;

a second inside side wall panel, said second inside side wall panel connected to said second outside side wall panel opposite to said bottom panel;

a first set of two first end wall stacking panels comprising a first, first end wall stacking panel and a second, first end wall stacking panel connected to opposite sides of the first outside side wall panel;

a second set of two first end wall stacking panels comprising a first, first end wall stacking panel and a second, first end wall stacking panel connected to opposite sides of the second outside side wall panel whereby, when the blank is folded into a produce field box, each of said first end wall stacking panels helps to support an end wall top deck

panel when a load is stacked on said end wall top deck panel;

four second end wall stacking panels, each of said second end wall stacking panels connected to a different first end wall stacking panel on the opposite side that the outside side wall panel is connected whereby, when the blank is folded into a produce field box, each of said second end wall stacking panels helps to support an end wall stacking panel when a load is stacked on said end wall top deck panel.

4,101,049

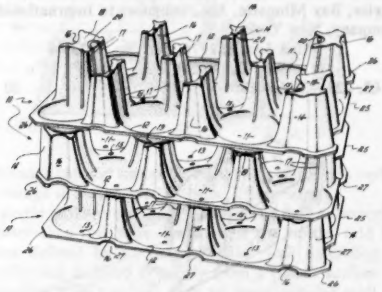
SHIPPING TRAY FOR FRUIT

Harry S. Wallace, Largo, Fla., and Robert C. Taylor, Florence, Ky., assignors to Hopple Plastics, Inc., Florence, Ky.

Filed Mar. 10, 1977, Ser. No. 776,216

Int. Cl.[2] B65D *81/16, 81/24, 81/26*

U.S. Cl. 229—2.5 R **4 Claims**



1. A stackable, nestable shipping tray for fruit comprising,

a single molded sheet having a generally planar peripheral border,

a plurality of fruit-receiving pockets formed in said sheets, the upper edges of said pockets lying in a plane,

a plurality of posts formed in said sheet and located adjacent said pockets, said posts projecting a uniform height above said plane a distance substantially greater than the depth of said pockets,

said pockets having a depth which is less than one-third the overall height of a tray,

said posts presenting generally vertical surfaces, said vertical surfaces having vertical grooves extending into said pockets,

said pockets having holes in the bottom thereof,

at least a portion of said pockets having an undersurface which is adapted to rest upon a respective post when a plurality of like trays, oppositely oriented, are in stacked relation,

said posts having upper surfaces which receive the undersurfaces of said pockets, said surfaces having grooves therein to facilitate air and liquid flow,

said posts, grooves and holes permitting air and liquid flow around the fruit between the top and bottom of a stacked group of filled trays.

4,101,050

FILLED-POLYSTYRENE LAMINATES

Ernest Jack Buckler, and Michael Hugh Richmond, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Sep. 14, 1976, Ser. No. 723,285

Claims priority, application Canada, Oct. 22, 1975, 238304

Int. Cl.[2] B65D *1/00;* **B32B** *27/08*

U.S. Cl. 229—3.5 R **6 Claims**

1. A thermoplastic polymeric laminate comprising at least one layer of polystyrene and at least one layer of filled styrene polymer composition containing from about 5 to about 50 parts by weight of filler, said filled styrene polymer composition being the product of mixing a styrene polymer masterbatch with polystyrene, said masterbatch comprising 100 parts by weight of impact polystyrene, from 1 to about 40 parts by weight of rubber selected from styrene-butadiene rubber, polybutadiene rubber, high cis-1,4-polyisoprene, thermoplastic rubber block copolymers comprising vinyl- or vinylidene-substituted aromatic hydrocarbon polymer blocks and conjugated diolefin polymer blocks, ethylene-pripylene-diene rubber and mixtures thereof, from 10 to 200 parts by weight of filler being an inorganic mineral filler selected from calcium carbonate, magnesium carbonate, calcium sulphate, aluminum oxide and hydrates thereof, clay, aluminum sulphate, silica, talc, mica, wollastonite, vermiculite, asbestos fibres and glass fibres, and from 1 to 40 parts by weight of mineral oil selected from a mixed naphthenic-aromatic oil and an aromatic oil.

4,101,051

PACKAGING MEANS

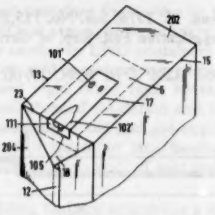
Wilhelm Reil, Im Tiefen Weg 8, Bensheim-Auerbach, Hessen, Germany

Filed May 10, 1976, Ser. No. 684,780

Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2520569; Jun. 11, 1975, 2530945

Int. Cl.[2] B65D *5/70, 5/54*

U.S. Cl. 229—17 R **13 Claims**



1. Packaging means for liquids or the like, comprising a spout portion and a wall extending into said spout portion, a perforation line in said wall defining a tear-off strip, and a covering strip of liquid-impervious material being secured to the inner surface of said wall and positioned over said perforation line to close and seal it, a portion of said tear-off strip remote from said spout portion being unattached to said covering strip to facilitate gripping and removal of said tear-off strip and opening of said spout portion.

4,101,052

CONTAINERS FOR TRANSFERRING MERCHANDISE BETWEEN DISTRIBUTION SERVICE CENTERS AND RETAIL STORES, WHILE SECURITY SEALED IN EITHER AN EXPANDED OR A REDUCED VOLUME CONFIGURATION

Douglas J. A. Dove, Edmonds, Wash., assignor to Interstore Transfer Specialists, Inc., Edmonds, Wash.

Filed Mar. 4, 1977, Ser. No. 774,323

Int. Cl.[2] B65D *5/35*

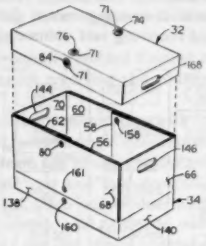
U.S. Cl. 229—23 R **20 Claims**

1. A container assembly reusable for many shipments and transfers, arrangeable either in an expanded volume configuration or alternately in a reduced volume configuration, comprising:

a. a cover subassembly having: a planar top surface structure and depending flaps forming a lid; and reinforcing antitear means for these depending flaps, thereby making this cover subassembly more resistant to rough handling; and

b. a bottom subassembly, having a planar, one piece bottom surface; four upstanding sides which pivot upwardly from the bottom surface along their respective common scores;

each score being common to a side of the bottom and the bottom edge of an upstanding side; volume changing flaps which pivot along the upstanding sides along their common scores, each score being common to the top edge of an upstanding side and to the bottom of a volume changing flap; additional volume changing structure, pivoting and unfolding from two opposite volume changing flaps



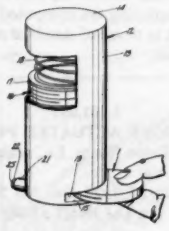
to supplement the strength of the container, the pivoting occurring along their common scores, each score being common to one eventually upright side of an additional volume changing flap and to an eventually upright side of an additional volume changing structure; and reinforcing antitear means for the volume changing flaps thereby making this bottom subassembly more resistant to rough handling.

4,101,053

DISPOSABLE PRODUCT APPLICATOR AND DISPENSING PACKAGE THEREFOR

John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 668,253, Mar. 18, 1976, Pat. No. 4,053,242.
This application May 13, 1977, Ser. No. 796,691
Int. Cl.² B65H *1/12*
U.S. Cl. 221—232 **12 Claims**



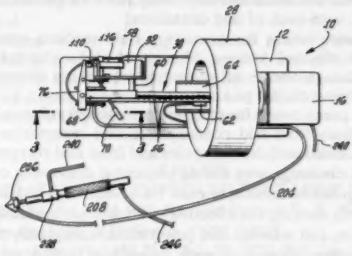
1. In combination a plurality of hand-held, T-shaped disposable product applicators and a dispensing package therefor, each of said applicators comprising an applicator pad portion and an upstanding finger grip portion, said pad portion being normally substantially planar with a top surface and a bottom product-applying surface, said upstanding finger grip portion being normally substantially planar with opposite sides providing finger grip surfaces, said finger grip portion being normally substantially perpendicular to and extending transversely across said top surface of said pad portion bisecting said pad portion into two substantially equal parts, each said pad portion being folded along its juncture with said finger grip portion with said bottom product applying surface folded upon itself, said finger grip portion being of a thickness substantially twice the thickness of said pad portion whereby said finger grip portion and said folded pad portion are substantially coplanar and of substantially the same thickness, said folded applicators being arranged in a stack located in said package, said package having a dispensing opening through which the endmost applicator of said stack may be removed from said package sequentially, means within said package to advance said stack toward said opening and to maintain said pad portion of each applicator of said stack folded, said pad portion of each of said applicators being fabricated of a material of such nature that said pad portion will spring to said normal substantially planar configuration upon removal of said applicator from said package.

4,101,054

PNEUMATIC AUTOMATIC SCREWFEEDER

Francis Edmund Frost, 301 Foothill Ave., Sierra Madre, Calif. 91024, and Robert Mack, 507 S. Arturo St., West Covina, Calif. 91791

Filed Sep. 30, 1976, Ser. No. 728,250
Int. Cl.² B65H *3/08*
U.S. Cl. 221—278 **16 Claims**

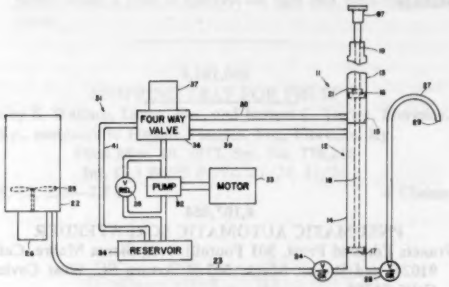


1. In an automatic screwfeeder,
screw carrying means having screw receiving means adjacent one end and having a screw discharge end adjacent its other end,
screw supplying means adjacent said carrying means for supplying screws to screw receiving means,
means associated with said carrying means to move said screws in said carrying means toward said discharge end for positioning for discharge,
first screw metering means associated with said carrying means at the discharge end to withhold and alternately discharge single screws from the carrying means at the discharge end,
the improvement comprising:
second screw metering means adjacent first metering means, said second metering means being associated with said carrying means and having means to receive and releasably hold a single discharge screw from said carrying means,
a feed tube connected at one end to said second metering means and connected at its other end to a screwdriver to supply screws thereto,
said means to releasably hold said single screw in said second metering means having actuating means to release said single screw to said feed tube to rest therein when said first metering means is withholding another single screw, and
means connected to said feed tube to move said single screw resting therein to said screwdriver when said first metering means discharges another single screw to said second metering means.

4,101,055
COLORANT DISPENSER HAVING TIME SEQUENCE DISPENSING CYCLE

Edward J. Poitras, 198 Highland St., Holliston, Mass. 01746

Filed Aug. 6, 1976, Ser. No. 712,328
Int. Cl.[2] B67D 5/30
U.S. Cl. 222—17 13 Claims



4. A fluid mixing and dispensing apparatus comprising:

a plurality of containers for fluid mediums to be combined;

a plurality of measuring receptacles, each defining a variable effective volume and one connected for fluid communication with each of said containers;

tubulation means for conveying fluid medium retained in said effective volume of each of said receptacles to a discharge nozzle, all of said nozzles being disposed in a common discharge area;

cyclic pump means for pumping preselected volumes of fluid medium from said containers to said receptacles during sequential withdrawal cycles and from said receptacles to said discharge area during sequential dispensing cycles;

an adjustable selector means for selectively and independently varying the effective volume of each of said receptacles, and wherein said pump means completely fills said effective volume of each receptacle during said withdrawal cycles to establish the preselected volume of fluid medium pumped from each of said containers to said receptacles;

cycle timer means for controlling the periods of said sequential withdrawal and dispensing cycles; and

sequence control means adjustable to provide a predetermined number of said sequential withdrawal and dispensing cycles, said sequence control means comprising sequence timer means for deenergizing said cyclic pump means after a time period encompassing a predetermined number of said sequential withdrawal and dispensing cycles.

4,101,056
TEMPERATURE-COMPENSATING PETROLEUM PRODUCT DISPENSING UNIT

George E. Mattimoe, 953 Wainiha St., Honolulu, Hi. 96825, and Michael P. Gouveia, Honolulu, Hi., assignors to George E. Mattimoe, Honolulu, Hi.

Continuation-in-part of Ser. No. 581,229, May 27, 1975, abandoned. This application Jul. 8, 1976, Ser. No. 703,465
Int. Cl.[2] G01F 1/00, 15/02
U.S. Cl. 222—26 43 Claims

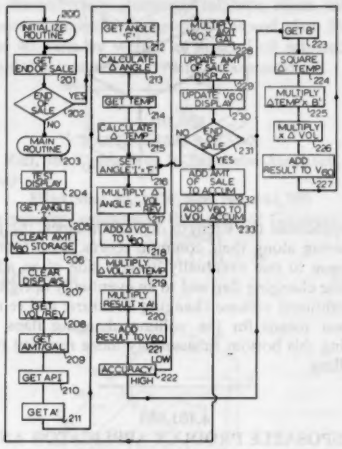
1. In apparatus for the transfer of liquid in terms of standard volume at a standard temperature, having a delivery conduit with an outlet delivery means, and means for moving the liquid through said outlet delivery means, the combination of:

thermometric means in said outlet delivery means for sensing continuously the instantaneous temperature of the liquid there and continuously deriving an analogous electrical signal therefrom,

signal transmitting means connected to said thermometric means for generating a thermal value electrical signal, corresponding to the sensed temperature, from said analogous electrical signal and for sending said thermal value electrical signal several times per second, upon command,

metering means at said outlet delivery means for generating and sending, upon command, at least as often as said signal transmitting means, volume electrical signals corresponding to volume of liquid transferred through said outlet delivery means,

rapid electronic computing means for repetitively commanding and receiving said volume signals and said thermal value signal, for incrementally calculating therefrom at intervals of several times per second during a delivery of liquid the volume delivered in each interval as corrected to said standard temperature, and for summing the total volume from initiation of each delivery through the latest calculated interval, and

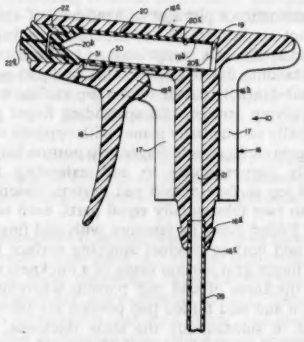


volume display means actuated by said computing means for continuously displaying the computed summed volume of dispensed liquid in terms of standard measure at said standard temperature.

4,101,057
TRIGGER ACTUATED PUMP

Lewis C. LoMaglio, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 2, 1976, Ser. No. 747,041
Int. Cl.[2] B65D 37/00
U.S. Cl. 222—207 14 Claims



1. A manually operable liquid dispensing pump for use and

incorporation on a container for a liquid to be dispensed comprising, in combination:

a. tubular bladder means having flexible walls which expand to their natural profile when depressed and relaxed, said bladder means having an upstream end and a downstream end, said downstream end having an integrally molded one-way valve means that permits fluid to flow outwardly from said bladder means, said upstream end of said bladder means being open to permit fluid to flow into said bladder means,

b. a one-piece, integrally molded housing means having:

i. cavity means for receiving and containing said bladder means,

ii. channel means communicating with said cavity means, said channel means being located substantially adjacent to said upstream end of said bladder means and between said upstream end and said downstream end of said bladder means when said bladder means is received in said cavity means, said upstream end of said bladder means sealing one end of said channel means to prevent fluids from entering said cavity means from said channel means when said bladder means is in a depressed position or in its natural profile, and permitting fluids to enter said bladder means while said bladder means is expanding to its natural profile, and

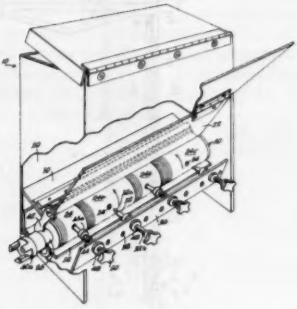
c. trigger means connected to said housing means for depressing said bladder means to pump fluids therefrom.

4,101,058

VARIABLE WIDTH GLASS SPHERE DISPENSER

Martin A. Smith, P.O. Box 708, Opa Locka, Fla. 33054

Filed Apr. 14, 1977, Ser. No. 787,692
Int. Cl.[2] G01F *11/20*
U.S. Cl. 222—274 **8 Claims**



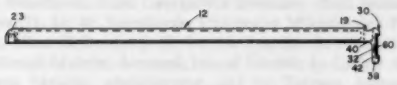
1. In apparatus for dispensing glass spheres or the like at prescribed adjustable widths by gravity feeding such spheres upon a roller, the improvement comprising, a common drive shaft, means for coupling said drive shaft to a rotative source for continuously rotating said drive shaft, a plurality of roller sections coaxially journalled on said drive shaft in substantially abutting end-to-end relation therealong, means for individually and selectively securing said roller sections to said drive shaft for rotation in unison therewith, a hopper above said roller sections for holding glass spheres to be dispensed, and an elongated discharge opening in the bottom of said hopper and substantially coextensive with the combined axial length of said roller sections for depositing glass spheres upon upper surface portions of said roller sections.

4,101,059

TALLY

John H. Batts; Judd F. Garrison, both of Grand Rapids, and Douglas F. Wolff, Marshall, all of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.

Filed May 25, 1977, Ser. No. 800,337
Int. Cl.[2] A47J *51/098*
U.S. Cl. 223—85 **20 Claims**



1. A device for displaying information on a garment hanger, comprising:

a flexible sheet member tally, said sheet member tally defining a locking detent notch intermediate the lateral edges thereof along a transverse edge, said sheet member tally also including a stop tab extending outwardly from the other transverse edge; and

a tally attaching means disposed on said hanger in plain view when a garment is suspended from said hanger for attaching said tally to said hanger, said attaching means including:

a first means defining a first groove and including a detent extending into said groove intermediate the ends thereof; and

a second means defining a second groove, said second groove positioned spaced from said first groove and including a stop, said tally being insertable into said grooves and dimensioned so that when said tab abuts said stop said detent is disposed within said notch.

4,101,060

HOLSTER WITH IMPROVED BELT LOOP LOCK

John E. Bianchi, 1601 Wilt Rd., and Richard D. E. Nichols, 813 Cozy Ct., both of Failbrook, Calif. 92028

Division of Ser. No. 492,757, Jul. 29, 1974, Pat. No. 3,977,583.
This application Apr. 26, 1976, Ser. No. 680,215
Int. Cl.[2] F41C *33/02*
U.S. Cl. 224—2 B **3 Claims**

1. A holster including a body portion defining a handgun cavity and a belt loop portion secured thereto and defining a belt loop for receiving a belt;

said belt loop portion defining an elongated opening having a height approximating the width of the belt on which it is to be worn and a width approximating the thickness of the belt;

said belt loop portion comprising a bight of leather having an open end;

a body of expansible-compressible material positioned at the edge of the elongated opening and closing the open end of said bight and securing the end portions of said bight together;

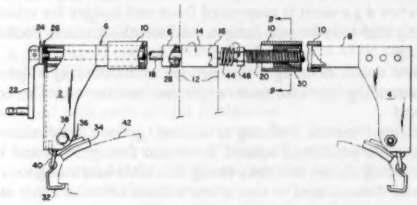
means for selectively expanding said body of expansible-compressible material into engagement with the edge of a belt passing through said opening by variable compression of said body of expansible-compressible material in a direction parallel to the width of said elongated opening and variable expansion of said last body toward the edge of said belt to prevent relative movement of said belt loop assembly and belt.

4,101,061

ADJUSTABLE CAR TOP CARRIER SUPPORT

Howard M. Sage, Phoenix, and John C. Abromavage, Tempe, both of Ariz., assignors to U-Haul International, Inc., Phoenix, Ariz.

Filed May 9, 1977, Ser. No. 794,900
Int. Cl.[2] B60R 9/04
U.S. Cl. 224—42.1 F **31 Claims**



1. An adjustable car top carrier support, operable for use on a gutterless car top having ledges at opposite sides thereof, comprising:

a. a first horizontal support tube, having an outer and an inner end, and including a first vertical support leg means proximate said outer end;

b. a second horizontal support tube, having an outer and an inner end, and including a second vertical support leg means proximate said outer end;

c. crankshaft means interconnecting said support tubes for horizontally contracting and extending said respective support tubes;

d. clutch means within said crankshaft means for limiting the amount of torque which may be applied by said crankshaft in contracting said support tubes; and

e. car top engaging means, extending from the bottom of each of said vertical support leg means, and operable for engaging a car top proximate said ledges at opposite sides of said car top, whereby upon contraction of said support tubes engagement forces are transmitted to said car top only in the vicinity of said opposite car top ledges and said clutch means is operable to limit the amount of the engagement force which may be exerted between said car top carrier and a car top.

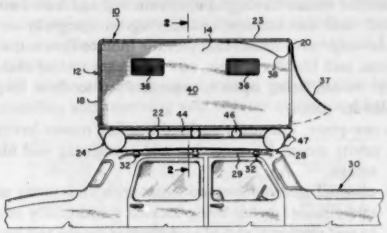
4,101,062

INFLATABLE CARTOP CARRIER AND SHELTER STRUCTURE

Benjamin E. Lazar, 5446 Cheena Dr., Houston, Tex. 77096

Filed Feb. 28, 1977, Ser. No. 772,809
Int. Cl.[2] B62D 33/04
U.S. Cl. 296—37.7 **6 Claims**

1. An inflatable structure having a cartop carrier case forming a chamber therein for securely and conveniently carrying, storing and sheltering objects when said structure is inflated, and to collapse into a small space when not in use, wherein, said structure includes:



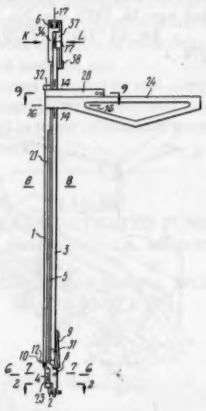
an inflatable horizontally-disposed bottom mattress, a roof, and front, rear and side walls extending between said mattress and said roof.

4,101,063

SURGICAL INSTRUMENT FOR LIGATING TUBULAR ORGANS IN DEEP CAVITIES

Nikolai Nikolaevich Kapitanov, 8 ulitsa Oktyabrskogo polya, 5, kv. 9, and Kim Nikolaevich Tsatsanidi, B. Cherkizovskaya ulitsa, 3, korpus 5, kv. 15, both of Moscow, U.S.S.R.

Continuation of Ser. No. 659,520, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 609,893, Sep. 2, 1975, abandoned, which is a continuation of Ser. No. 463,795, Apr. 24, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,365
Claims priority, application U.S.S.R., Oct. 30, 1973, 1974031
Int. Cl.[2] B25C 1/00
U.S. Cl. 227—19 **4 Claims**



1. A surgical instrument for ligating tubular organs in deep cavities of the human body, which comprises: in combination a first elongate element with opposite ends; a magazine containing a U-shaped staple mounted on said first element at one of the ends thereof; a second elongate element with opposite ends assembled next to and in parallelism with said first element, said second element comprising driving means for forcing said staple out of the magazine by longitudinal movement of said second element relative to said first element; a third elongate element assembled next to and in parallelism with said second element; a needle-shaped die secured to one of the ends of said third element and extending axially beyond said magazine for bending the staple forced out of the magazine by the driving means; said first and second elements being movable longitudi-

nally in unison with respect to said third element; a spring-loaded mechanism movably mounted on said first element near said one of said ends thereof, said mechanism being operative to press and fix a portion of a tubular organ grasped by the die when the first and second elements are moved longitudinally with respect to the third element into an operative position with said mechanism adjacent said die; said needle-shaped die including a hook adapted to grasp the tubular organ while in tissue which the die pierces and while the first, second and third elements are manually rotated in said operative position about the longitudinal axis of the instrument, said second element in said operative position being longitudinally movable relative to said first and third elements to force the staple from the magazine, a movement-limiting means mounted on the opposite ends of the first and second elements for limiting the extent of movement of the second element relative to the first element: and cooperating groove means provided on said first element, the magazine, the third element and the die including portions permitting the legs of a staple to pass along the die as far as the hook on which the legs of the staple are bent when the staple is pushed out of the magazine by the driving means.

4,101,064

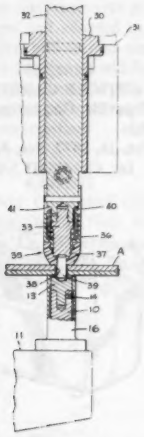
SLUG RIVETING APPARATUS

Joseph Vargo, Jr., West Seneca, and John W. Davern, North Tonawanda, both of N.Y., assignors to General-Electro Mechanical Corp., Buffalo, N.Y.

Division of Ser. No. 735,388, Oct. 26, 1976, Pat. No. 4,060,189. This application May 17, 1977, Ser. No. 797,682

Int. Cl.² B21J *15/36*

U.S. Cl. 227—53 **4 Claims**



1. Apparatus for inserting a generally cylindrical rivet blank in workpieces and for forming heads at opposite ends thereof comprising a pair of coaxial head forming anvils at opposite sides of the workpieces and means for moving said anvils relatively toward each other to form said rivet heads, each of said anvils having a rivet head forming recess therein comprising a flat circular bottom wall of substantially the same diameter as the end of a rivet blank and a flaring side wall for guiding the associated end of said rivet blank into abutment with said bottom wall whereby the rivet blank is accurately positioned and held in coaxial alignment with said head forming anvils.

4,101,065

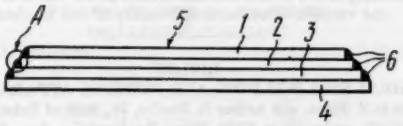
METHOD OF MANUFACTURING MULTILAYER CONVEX COLLARED COVERS AND BOTTOMS FOR PRESSURE VESSELS

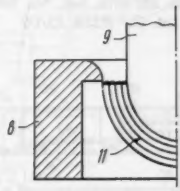
Alexandr Nikolaevich Novikov, ulitsa Kurchatova, 9, kv. 41; Evdokia Danilovna Kudrikova, ulitsa Sovetskaya, 160, kv. 7; Marat Moiseevich Shel, ulitsa Kievskaya, 4, kv. 15; Pavel Gdalievich Pimshtein, ulitsa Kurchatova, 9, kv. 45, all of Irkutsk; Nikolai Kirillovich Globin, ulitsa Griboedova, 20, kv. 64, Sverdlovsk; Boris Georgievich Ziselman, ulitsa Inzhenernaya, 71, kv. 45, Sverdlovsk; Vyacheslav Mikhailovich Potulov, ulitsa Griboedova, 19, kv. 14, Sverdlovsk; Alexei Mikhailovich Maletin, deceased, late of Irkutsk; by Ljubov Alexeevna Maletin, administrator, and by Tatyana Alexeevna Maletina, administrator, both of ulitsa Kurchatova, 56, kv. 41, Irkutsk, all of U.S.S.R.

Filed Nov. 18, 1976, Ser. No. 743,063

Int. Cl.² B23K *31/02*

U.S. Cl. 228—155 **3 Claims**





1. A method of manufacturing multilayer convex collared covers and bottoms for pressure vessels including the steps of: assembling a pack of circular sheet blanks in the form of a truncated cone by placing one blank on another; forming said cone where the diameter of the upper smaller blank is equal to the developed length of the internal layer of the bottom; selecting the diameter of each subsequent blank so that the base angle of the truncated cone is equal to from **40°–65°**; and welding said pack blanks one to another along their perimeter; stamping said blanks at a temperature of **800°–1100°** C and preparing said blanks for further welding at surfaces to be subsequently welded.

4,101,066

SOLDERING METHOD AND APPARATUS UTILIZING DUAL SOLDER WAVES OF DIFFERENT VARIABLE VELOCITIES

Vincent A. Corsaro, Haverhill, and Ernst A. Gutbier, North Andover, both of Mass., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,559

Int. Cl.² B23K *1/02;* H05K *3/34*

U.S. Cl. 228—180 R **10 Claims**

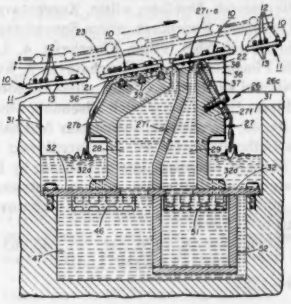
1. A method of soldering an electrical device which is movable along a predetermined path, which comprises:

producing a first solder wave which flows counter to the direction of movement of the electrical device along the predetermined path;

producing a second solder wave which flows in the direction of movement of the electrical device along the predetermined path;

moving the electrical device along the predetermined path

so that the electrical device engages the first and second solder waves in succession; and



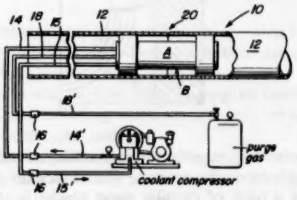
feeding solder to said first and second solder waves at different variable velocities indpendently of one another.

4,101,067

HEAT SINK WELDING AND PURGING APPARATUS

Mario S. Sloan, and Arthur B. Renfro, Jr., both of Bakersfield, Calif., assignors to Sloan Purge Products Co., Inc., Bakersfield, Calif.

Filed Jul. 23, 1976, Ser. No. 708,224
Int. Cl.[2] B23K *35/00*
U.S. Cl. 228—222 **22 Claims**



7. A purging and cooling apparatus for use with the welding of cylindrical members, comprising: inflatable means for expandable engagement with the cylindrical members to be welded adjacent the weld joint, and means for adding inflation and coolant medium to the inflatable means for inflating the inflatable means and cooling the area near the weld joint, the inflation and coolant medium being the same fluid material.

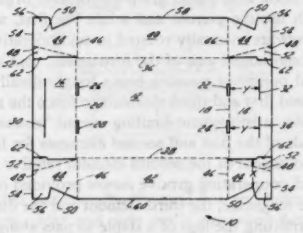
4,101,068

DIE CUT TRAY

Stanley Edward Buck, Montreal, Canada, assignor to Domtar Inc, Montreal, Canada

Filed Nov. 30, 1977, Ser. No. 856,011
Int. Cl.[2] B65D *5/26*
U.S. Cl. 229—35 **7 Claims**

1. A blank forming a tray, comprising a bottom wall, end walls foldably connected one to each end of said bottom by a fold-line, at least one slit in each of said end wall, at least one slot in said bottom wall adjacent to each of said fold-lines, a pair of side walls one foldably connected to each side of said bottom wall by a fold-line substantially perpendicular to said fold-lines connecting said end walls to said bottom wall, end flaps foldably connected one to each end of each of said side walls by a fold-line substantially perpendicular to the fold-line connection between said side wall and said bottom wall, each of said end flaps terminating in a free end and being provided with an upper tab formed in said flap and a bottom tap projecting down from said flap and a diagonal fold line extending across said flap from said free edge toward the junction of the fold-line connection between said flap and said side wall to which it is attached and said fold-line connecting said side wall to which is attached to said bottom wall, said, at least one slit in each said end wall and said diagonal fold-line in each said flap being arranged so that each said end flap may be folded



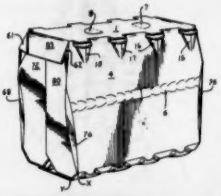
along said diagonal fold-line to permit movement of each said end flap into a position wherein the top edge and upper flap may be received in the adjacent of said slits in said end wall, when said end flap is in face to face relationship with its adjacent end wall, said lower tab being positioned to co-operate with the adjacent said slot in said bottom wall when said tray is erected.

4,101,069

ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 26, 1977, Ser. No. 845,471
Int. Cl.[2] B65D *5/02*
U.S. Cl. 229—40 **5 Claims**

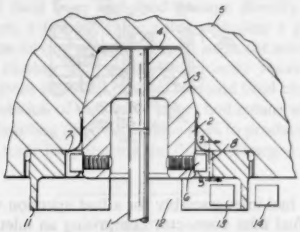


1. An article carrier comprising a top wall, a pair of side walls secured respectively to the side edges of said top wall, a bottom wall secured to the edges of said pair of side walls remote from said top wall, a connecting panel foldably joined to an end edge of one of said walls along a first arcuate fold line, an end panel foldably joined to said connecting panel remote from said one wall along a second arcuate fold line, said first and second arcuate fold lines being configured in a concave relationship with respect to said connecting panel, and said connecting panel being disposed inwardly with respect to the associated end of the carrier and at an acute angle to said one wall so as to impart inward bowing to said end panel.

4,101,070
CENTRIFUGE ROTOR COUPLING

Gordon Harold Hoare, Horsham, and Brian Walter Lovegrove, Crawley, both of England, assignors to Fisons Limited, London, England

Filed Jan. 24, 1977, Ser. No. 761,669
Claims priority, application United Kingdom, Feb. 7, 1976, 4848/76
Int. Cl.[2] B04B 9/00
U.S. Cl. 233—1 R 8 Claims

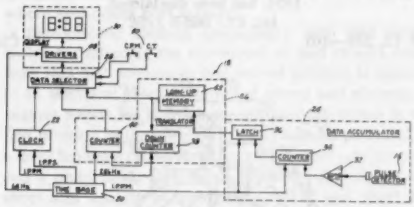


1. A centrifuge assembly comprising a rotor;
a rotatable drive shaft;
bayonet mounting means for removably engaging said rotor to said drive shaft,
said mounting means comprising a first member attached to one of said rotor and said drive shaft and a second member attached to the other of said rotor and said drive shaft,
said first member being provided with a central longitudinal recess and at least one peripheral socket communicating with said recess, said socket having at least two opposed side walls, at least one of which is inclined at an obtuse angle to a plane normal to the axis of rotation of said rotor;
said second member comprising a drive head adapted to be received in said recess of said first member, said drive head having at least one transverse pin extending radially outwardly therefrom and adapted to be received in said socket when said first and second members are engaged, whereby on relative rotation of said first and second members, said pin bears against said side wall to generate a longitudinal component of force tending to urge said first and second members together.

4,101,071
ELECTRONIC CALORIE COUNTER

Carl Brejnik, 1327 S. 79th, Omaha, Nebr. 68124, and William T. Whitlow, 217 W. Park La., Waterloo, Iowa 50701

Filed Apr. 4, 1977, Ser. No. 783,974
Int. Cl.[2] G06M 3/06
U.S. Cl. 235—92 MT 7 Claims

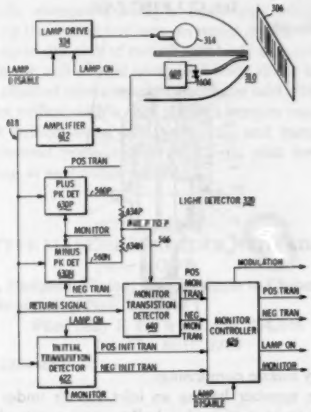


1. An electronic calorie counter comprising,
a portable pulse detector means adapted to be attached to a person's wrist and worn during daily activities for detecting the heart pulse of the person,
electronic circuit means including an electronic counter means operatively connected to said pulse detector means for totalizing the detected pulses for a predetermined time for determining the pulse rate,
electronic computer means operatively connected to said counter means for converting the detected pulse rate into the approximate calorie burn rate in response to programmed information in the computer means,
said electronic computer means including means for computing the calorie burn total, for a predetermined length of time, in response to the computed calorie burn rate,
and visual display means operatively connected to said means for computing the calorie burn total for displaying the computed calorie burn total.

4,101,072
DATA-GATHERING DEVICE FOR SCANNING DATA HAVING A VARIABLE AMPLITUDE MODULATION AND SIGNAL TO NOISE RATIO

Daniel J. Weaver, San Jose, Calif.; Robert Treiber, Centerport, N.Y., and Joseph Pernyeszi, Mountain View, Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,694
Int. Cl.[2] G06K 7/10, 11/02
U.S. Cl. 235—455 7 Claims



1. Apparatus having a standby mode for initially illuminating a data source in relative motion therewith with pulses of light and detecting initial transitions in the intensity of the light reflected from the data source, and having an operate mode thereafter for illuminating the data source with a continuous light and detecting subsequent transitions in the intensity of the light reflected from the data source, comprising:
a lamp driver means having a pulse output during the standby mode and a continuous output during the operate mode;
a lamp means responsive to the lamp driver for illuminating the data source with pulses of light during the standby mode and with continuous light during the operate mode;
a light sensitive means responsive to the transitions in the intensity of the light reflected from the data source for providing a return electric signal with corresponding transitions;
initial transition detecting means responsive to the return signal from the light sensitive means for detecting the transitions therein corresponding to the initial transitions in the reflected light;
mode control means responsive to the initial transition detecting means for temporarily establishing the continuous operate mode within the lamp driver;
resettable peak detector means for retaining the most recent plus and minus voltage peaks of the return signal from the

light sensing means for maintaining an average peak to peak signal; and

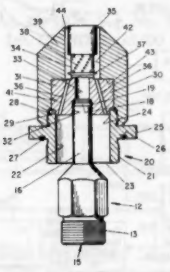
operate transition detector responsive to the average peak to peak signal from the peak detector means and to subsequent transitions in the return signal from the light sensing means for detecting transitions therein relative to the average peak to peak signal to provide transistion signals which reset the peak detector means to the most recent plus and minus voltage peaks.

4,101,073

TWO-FLUID SPRAY NOZZLE PRODUCING FINE ATOMIZATION OF LIQUID

James Hall Curran, North Chelmsford, Mass., assignor to Spray Engineering Company, Nashua, N.H.

Filed Aug. 25, 1977, Ser. No. 827,701
Int. Cl.[2] F25C *3/04*
U.S. Cl. 239—14 **6 Claims**



1. A spray nozzle comprising:

(a) a base member having an inlet for air under pressure leading to an open-ended hollow post outstanding from the base member;

(b) a body member associated with the base member for the reception of water under pressure and for the flow of the water out of the body member;

(c) a distributor associated with the body member and having a closed-ended hollow post portion forming an axial continuation of the hollow post outstanding from the base member,

(i) the distributor also being provided with a base having an annular arrangement of water passages located exteriorly of the hollow post continuation portion to receive the water flowing out of the body member,

(ii) the distributor also being provided with a shoulder forming a knife-edged deflector in the paths of discharge of water from the distributor base passages,

(iii) the distributor hollow post continuation portion being provided with annular rows of passages leading from its interior and located downstream from the shoulder for the discharge of air outwardly into the water deflected by the knife-edged shoulder; and

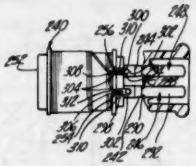
(d) a cap associated with the body member substantially enclosing the distributor hollow post continuation portion in spaced relation thereto and provided with a discharge orifice, said cap and continuation portion forming a mixing chamber for the air and water prior to discharge from said orifice.

4,101,074

FUEL INLET ASSEMBLY FOR A FUEL INJECTION VALVE

Alexander Michael Kiwior, Warren, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 697,173, Jun. 17, 1976, Pat. No. 4,030,668.
This application Mar. 25, 1977, Ser. No. 781,086
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—585 **1 Claim**



1. In a fuel inlet assembly for a fuel injection valve

(a) A fuel inlet connector comprising an inlet tube portion separated from an outlet tube portion by a radially extending flange portion, said flange portion having at least one terminal insulating post aperture therethrough between first and second flange sides; and

(b) a coil and terminal assembly comprising a coil bobbin and a thin terminal,

i. said coil bobbin having first and second radially extending flanges separated by an axially extending central portion positioned on said outlet tube portion, one of said bobbin flanges comprising a terminal insulating post extending axially therefrom through said aperture, said terminal insulating post having first and second ends separated by a thin slot extending the axial length of said post, said first end terminating at said one bobbin flange and said second end terminating outboard said second inlet connector flange side, said terminal post further comprising an oblong opening having a floor defined by said thin slot and a dimple locking wall extending radially outwards intermediate said first and second terminal post ends, and

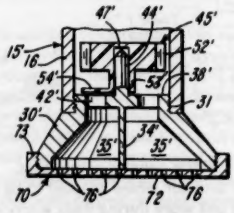
ii. said thin terminal having a narrow length portion received in said thin slot, said narrow length portion having a dimple across substantially the entire width thereof, said dimple being engaged by said dimple locking wall to restrain said thin terminal from axial movement in said thin slot.

4,101,075

PULSATING FLUID SPRAY DEVICE

Charles J. Heitzman, 1024 Waieli St., Honolulu, Hi. 96821

Filed May 12, 1977, Ser. No. 796,190
The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—101 **7 Claims**



1. A pulsating fluid spray device adapted for use as a shower head, comprising a housing defining a fluid passage having an

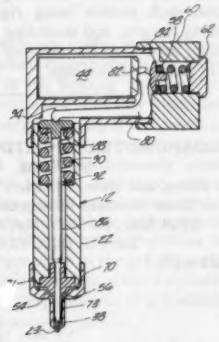
inlet adapted to be connected to a fluid supply, said housing including a discharge end portion having a plurality of angularly disposed partitions defining a corresponding plurality of fluid chambers therebetween, a discharge end wall connected to said housing and having means defining a plurality of nozzle discharge orifices for each of said fluid chambers, a generally flat stator wall connected to said housing and spaced upstream from said discharge end wall in generally parallel relation, said partitions extending from said stator wall to said discharge end wall, means defining a plurality of angularly spaced ports within said stator wall between said partitions and providing for a flow of fluid from said fluid passage directly into said fluid chambers, a turbine valve rotor including a projecting closure portion having a rotational path adjacent said ports for successively closing said ports momentarily restricting the flow of fluid from said fluid passage into said fluid chambers in response to rotation of said valve rotor, and means within said housing for directing the fluid along a path to produce rotation of said valve rotor for pulsating the fluid discharged from said orifices.

4,101,076

PIEZOELECTRIC FUEL INJECTOR VALVE

Hans U. Bart, Whitehall, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 509,892, Apr. 3, 1975, Pat. No. 4,022,166.
This application Jan. 3, 1977, Ser. No. 756,201
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—584 **5 Claims**



1. A liquid fuel injector valve for an internal combustion engine said valve comprising:

a. a valve body adapted to contain liquid fuel therein under pressure, said valve body having a liquid fuel inlet port and a liquid fuel outlet port;

b. closure means movable between a first position where said closure means closes said outlet port to a second position where said outlet port is open;

c. a piezoelectric element cooperative with said closure means for effecting the movement of said closure means from said first position to said second position in response to an electrical potential imposed across said element;

d. biasing means for maintaining said closure means in said first position in the absence of said imposed potential;

e. a lever having a relatively short arm, a relatively long arm and a pivot point therebetween, means for biasing said short arm against said element so that said short arm follows the movements of said element, wherein said long arm is mechanically coupled to said closure means whereby said lever magnifies the stroke of said closure means relative to the stroke of said element; and

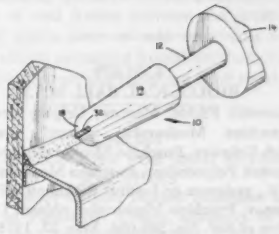
wherein the opening of said outlet port causes liquid fuel contained within said valve body under pressure to jet from said outlet port.

4,101,077

CAULKING SPOUT

Robert R. Gibson, Atlanta, Ga., assignor to William J. Van Horne, Atlanta, Ga.

Filed Apr. 4, 1977, Ser. No. 784,080
Int. Cl.[2] B05B *1/06*
U.S. Cl. 239—598 **10 Claims**



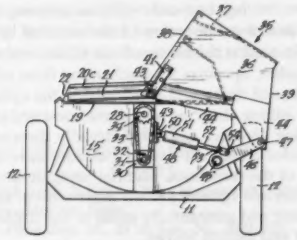
1. A caulking spout through which caulk may be dispensed from a dispenser into a corner joint at various angles of attack without an accompanying substantial change in the shape of the bead of caulk being dispensed and with the spout comprising a body elongated along a body axis merging with a rounded tip traversing said axis; an outlet orifice formed in said rounded tip to one side of and off said body axis; an inlet orifice formed in the end of said elongated body distal said rounded tip and a channel communicating between said inlet orifice and said outlet orifice with a first channel portion extending from said inlet orifice along said body axis and merging with a second channel portion diverging from said body axis and terminating at said outlet orifice.

4,101,078

FLAIL TYPE MANURE SPREADER WITH ADJUSTABLE HOOD

James H. Hodgson, Vinton, Iowa, assignor to Chromalloy American Corporation, New York, N.Y.

Filed May 5, 1977, Ser. No. 794,146
Int. Cl.[2] A01C *3/06*
U.S. Cl. 239—651 **17 Claims**



1. In a manure spreader of the type having a wheeled container which is substantially one-half a cylinder having upright, substantially semi-circular end walls, a driven shaft journalled on said end walls on the longitudinal axis of the cylinder, and flexible flails on the shaft to discharge manure over a discharge side of the container, and a fixed shield extending upwardly from a rear side of the container toward said discharge side, the improvement comprising, in combination:

a hood having a top wall and upright end walls which are principally above said container end walls with lower portions overlapping the container end walls, said hood having a discharge side which is high above the discharge side of the container and having a rear side which is a short distance above the fixed shield;

mounting means on the container operatively connected to said hood end walls and supporting the hood for fore-and-aft movement on the container between a first position with its discharge side contiguous to the discharge side of the container and a second position straddling said rear side of the container;

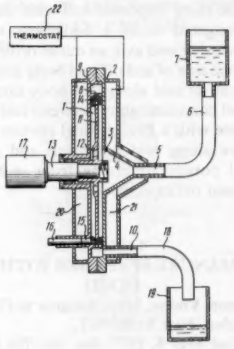
and power operated means connected to said mounting means for moving the hood between said first and second positions.

4,101,079

BIOLOGICAL BALL MILL

Boris Abramovich Fikhte, Moscow; Grigory Aronovich Gurevich, Puschino Moskovskoi oblasti; Vyacheslav Mitrofanovich Ushakov, Puschino Moskovskoi oblasti, and Viktor Sergeevich Polpudnikov, Puschino Moskovskoi oblasti, all of U.S.S.R., assignors to Institut Biokhimii I Fiziologii Mikroorganizmov, Puschino Moskovskoi oblasti, U.S.S.R.

Continuation of Ser. No. 580,686, May 23, 1975, abandoned.
This application Sep. 3, 1976, Ser. No. 720,616
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.15 **6 Claims**



1. A disintegrator comprising a: cylindrical milling chamber having a width substantially smaller than the diameter thereof; said chamber having two end walls; an opening for feeding into said chamber a suspension of the material being disintegrated and located at the center of one of said end walls fo the milling chamber; openings for discharging from said chamber the suspension of disintegrated material in the cylindrical surface of said milling chamber; an agitator mounted at the center of said milling chamber and concentrically therewith; milling bodies made of a material having a density corresponding to the density of the suspension material being disintegrated, the space between said agitator and the inner walls of said chamber being constant and substantially equal to the thickness of 5 to 10 layers of said milling bodies.

4,101,080

BEATER MILL

Hartinus Thomsen Schmidt, Kolding, Denmark, assignor to Schmidt & Sonner Maskinfabrik A/S, Kolding, Denmark

Filed Jul. 7, 1976, Ser. No. 703,242
Claims priority, application Denmark, Jul. 11, 1975, 3176/75; Jun. 24, 1976, 2841/76
Int. Cl.[2] B02C *23/08*
U.S. Cl. 241—51 **3 Claims**

1. A beater mill comprising

a cylindrical housing,

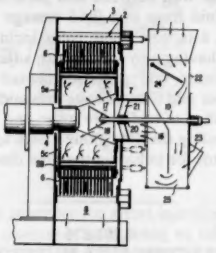
a rotor mounted for rotation in said housing, said rotor including

a hub and

at least two fan blades arcuately spaced about the rotor axis, said fan blades each having

a plurality of beaters thereon, the beaters of one of said fan blades being axially offset with respect to the beaters of another of said fan blades,

said cylindrical housing including a peripheral screen area, the outer portions of said fan blades having an axial width corresponding to the width of said peripheral screen area, the inner portions of said fan blades having a reduced axial width and forming an axial recess in said rotor,



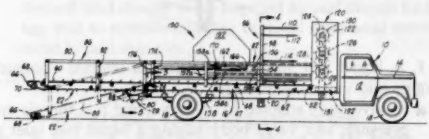
inlet means for delivering both air and solids to said housing including an inlet duct terminating within said recess of said rotor coaxially therewith, a distributor mounted within said recess coaxially with said inlet duct and said rotor and for axial adjustment relative to said rotor, said peripheral screen area including a plurality of arcuate sections, each section being rigid and having axially-extending flanges, and mounting means on said housing including axial slots for carrying the flanges of said sections in sliding relationship.

4,101,081

HAY LOADING, TRANSPORTING AND FEEDING SYSTEM

Orville A. Ritter, and Dale H. Ritter, both of Alva, Okla., assignors to Ritter Brothers Enterprises, Inc., Alva, Okla.

Filed Mar. 14, 1977, Ser. No. 777,566
Int. Cl.[2] B02C *13/286*
U.S. Cl. 241—101.7 **27 Claims**



1. A vehicular system for loading, transporting and feeding baled hay comprising:

an elongated bed having a forward end and a rear end;

ground-engaging wheels supporting the bed;

a rearwardly extending bed extension pivotally connected to the rear end of said bed for pivotal movement about a horizontal axis into a ramp-forming position;

a bale moving conveyor, having a pair of parallel transversely spaced endless chains each having an upper run and a lower run, supported on said bed and said bed extension and each of said chains extending from the forward end of said bed to the rear end of said bed extension and including a portion movable with said bed extension during the pivotal movement thereof;

bale-retaining fences disposed on opposite sides of said bed and bed extension;

a lateral bale pick-up cradle assembly pivotally mounted on one side of said bed for pivotal movement about a horizontal axis from a vertically extending position upwardly

from said one side of the bed to a position extending downwardly and outwardly from said one side of said bed; and

a bale cutting and disintegrating assembly mounted on said bed at the forward end thereof for receiving a bale of hay moved forwardly on said conveyor.

4,101,082

ELECTRIC MOTOR-DRIVEN COFFEE MILL

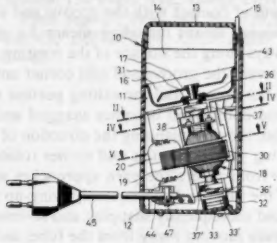
Rolf Mayer, and Max Speckhart, both of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Germany

Filed May 2, 1977, Ser. No. 792,864

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620800; May 15, 1976, 2621681

Int. Cl.² B02C *18/24*

U.S. Cl. 241—282.1 **12 Claims**



1. In an electric motor-driven coffee mill having a housing with a grinding cup disposed therein above the bottom of the housing, a drive motor in the housing disposed beneath the bottom of the grinding cup, and a rotatably supported comminuting tool disposed above the bottom of the grinding cup and driven by the drive motor, the improvement comprising said grinding cup being at least approximately circular and obliquely arranged in said housing, said drive motor being a salient-pole motor with an asymmetrically arranged field coil, the axis of said salient-pole motor being inclined such that the field coil extends on one side beyond a projection of the cup perpendicular to the oblique plane of the grinding cup, and the contours of said salient-pole motor lie inside a cylinder formed by a projection of the cup perpendicular to a horizontal plane.

4,101,083

HOUSING FOR ROLL STANDS FOR GRINDING CEREALS OR SIMILAR MATERIAL

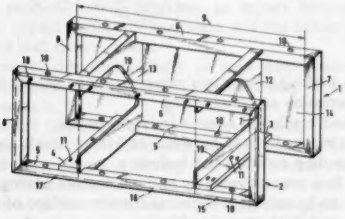
Walter Faist, Vechelde, Fed. Rep. of Germany, assignor to Buhler-Miag GmbH, Braunschweig, Fed. Rep. of Germany

Filed Mar. 9, 1977, Ser. No. 775,984

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610742

Int. Cl.² B02C *4/02, 23/00*

U.S. Cl. 241—285 R **4 Claims**



1. A housing for roll stands for grinding cereals or similar material comprising a support structure including rigid, vertical frames each having an internal length greater than a roll stand to be mounted in said housing; a pair of transverse bars connecting said frames in spaced relationship to each other; and cover means connected to said support structure for enclosing a space in which the grinding operation is to be performed, said cover means including a pair of vertical transverse walls extending spaced from each other and spaced from opposite ends of said frames between the latter for partly enclosing said space, each of said transverse walls being formed with a cutout permitting frontal insertion of a roll stand into the support structure and removing a roll stand therefrom.

4,101,084

WORK-POST CONSOLE FOR SEMI AUTOMATIC MACHINES

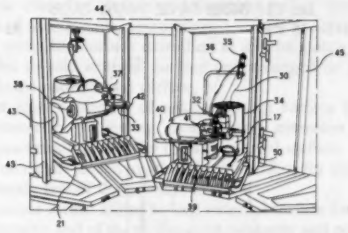
Pierre André; Robert Caretti; Michel Depoutot, and Gérard Mercet, all of Pontarlier, France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 5, 1977, Ser. No. 794,191

Claims priority, application France, May 31, 1976, 76 16381

Int. Cl.² H01F *41/02;* B65H *54/02, 54/72*

U.S. Cl. 242—7.11 **17 Claims**



1. A work-post for semi-automatic machines comprising: multiple cabins, each accommodating one of said machines, and said work-post further including means for movement and guidance of the machines in advancement out of their cabins and return to them, means for opening and closing the cabins as the machines are respectively advanced and retracted, means for indicating that machines have completed their tasks, and means for control of the motion of said machines in and out of their cabins.

4,101,085

RADIALLY EXPANSIBLE COLLET FOR A TUBULAR SLEEVE

David Michael Arno, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Jun. 28, 1976, Ser. No. 700,103

Int. Cl.² B65H *54/74, 75/30, 79/00*

U.S. Cl. 242—18 G **10 Claims**

1. A radially expansible supporting collet for a light-weight tubular sleeve, said collet comprising,

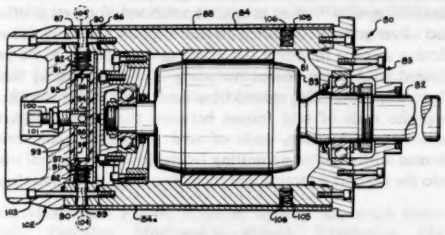
(a) a tubular housing mounted for rotation,

(b) a plurality of axially extending ribs on the exterior of said housing, each of said ribs having a cross-section of larger circumferential extent at its outer portion than at its inner portion,

(c) axially elongated sleeve-contacting bars mounted on each of said ribs in rib-embracing relationship thereto for limited radial movement relative to the associated one of said ribs, and

(d) a circular bladder at only one end of the housing for moving the corresponding ends of said bars radially outwardly for expanding the effective diameter of said collet

for engagement of said bars with the inner surface of said sleeve and resilient means carried by said housing for



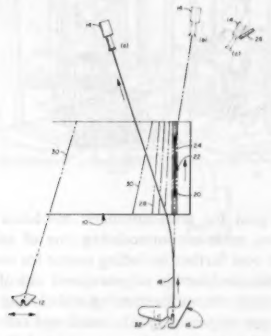
biasing the other ends of said bars in their radially outward position.

4,101,086

YARN TIE-UP AND TRANSFER TAIL METHOD, AND YARN PACKAGE TUBE AND APPARATUS FOR THE METHOD

William A. Thomas, Jr., Bristol, Va., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,276
Int. Cl.[2] B65H *54/02, 54/34, 75/28*
U.S. Cl. 242—18 PW **31 Claims**



1. In a textile yarn package tube particularly adapted for use in high speed rotary winding operations of yarn, said tube comprising a substantially cylindrical body having formed in its external surface adjacent one end thereof a groove defined by a pair of side walls extending into the surface of said body and extending at least partly around said body in a plane substantially perpendicular to the rotation axis of the tube, the improvement comprising: a corner formed in one of the groove side walls intersecting at an angle with said one side wall of the groove and pointing generally in the direction of intended rotation of the tube and adapted in rotary winding of yarn operations, as a yarn enters the groove in one direction of movement, for snagging yarn exiting from the groove and deflecting said yarn around said corner for changing the direction of movement of the exiting yarn to thereby trap and sever the yarn for winding.

22. Apparatus for forming a yarn transfer tail on a yarn package tube that is supported on a rotating mandrel of a yarn winder, the yarn moving continuously from a source of supply to the yarn package tube for engagement with a portion of the surface thereof and away from the yarn package tube, the portion of said surface to be engaged rotating in the same direction as the direction of yarn movement, the yarn winder having a self-threading yarn traverse guide reciprocating along a path parallelly spaced from the package portion of the yarn package tube, the supported yarn package tube comprising:

a. a substantially cylindrical body having formed in its external surface adjacent one end thereof a groove defined by a pair of side walls extending into the surface of the cylindrical body and extending at least partly around said cylindrical body in a plane substantially perpendicular to the rotation axis of the tube, and

(b) the cylindrical body also having a corner formed in one of the groove side walls intersecting at an angle with said one side wall of the groove and pointing generally in the direction of intended rotation of the tube and adapted in rotary winding operations, as a yarn enters the groove in one direction of movement, for snagging a portion of the yarn exiting from the groove and deflecting said yarn around said corner for changing the direction of movement of the exiting yarn portion as said corner rotates with said tube away from where the yarn approaches said surface portion of the tube; the apparatus comprising:

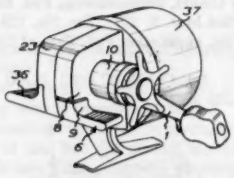
means for positioning the continuously moving yarn in engagement with said surface portion of the yarn package tube in a partial arch at an initial location that is away from and out of contact with the groove and said corner; said positioning means including means for guiding the yarn sideways along the surface of the rotating yarn package tube toward the groove and said corner until the yarn drops into the groove and the exiting portion of the yarn engages said corner and becomes snagged and deflected therearound, thereby changing the direction of movement of the exiting yarn portion as said corner rotates with the tube away from where the yarn approaches said surface portion of the tube, and consequently tying-up the yarn to the tube, and subsequently snapping and severing the yarn from the yarn moving away from the tube; and said positioning means also including means guiding the continuously moving yarn, as consequently tied-up to the rotating supported tube, to form a waste bunch of a predetermined number of wraps and a transfer tail of a predetermined number of spaced helical wraps adjacent to the waste bunch, with subsequent release of the guided yarn to be picked-up by said yarn traverse guide for guiding the yarn as the yarn package is wound.

4,101,087

BRAKING DEVICE IN A NON-ROTARY TYPE FISHING REEL

Kurt Johan Stausgaard Harre, Karlshamn, and Kenth Anker Thufvesson, Asarum, both of Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden

Filed Jul. 1, 1976, Ser. No. 701,962
Claims priority, application Sweden, Jul. 7, 1975, 7507747
Int. Cl.[2] A01K *89/01, 89/02*
U.S. Cl. 242—84.2 A **10 Claims**



1. A braking device in a non-rotary type fishing reel having a transmission and comprising

a hand crank and a line winding member,

gear means located between said hand crank and said line winding member and including

a face gear drivable by said hand crank having a substantially smooth peripheral friction surface of revolution and teeth on a side face,

a pinion gear connected to said line winding member and positioned to engage said teeth of said face gear

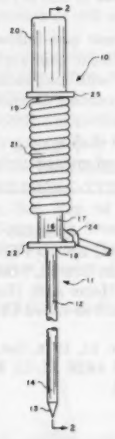
a gear housing supporting said gear means,
a reel frame supporting said gear housing,
a lever thumb-operated friction braking knob of the type of lever formed by a bar with its fulcrum between an area of thumb applied power on one side of said fulcrum and a frictional braking area on the other side of said fulcrum, pivotally mounted at the rear of said gear housing, and having an operating position including said area of thumb applied power extending exteriorly of said housing, and a braking portion including said frictional braking area extending into said housing, and located for moving said frictional braking area into contact with said peripheral friction surface of revolution to exert a braking moment on said peripheral surface of revolution proportional to the pressure exerted on said operating portion.

4,101,088

MANUAL IMPACT STAKE DRIVING APPARATUS

Tommy E. Stauth, 110 Plaza Ave., Dodge City, Kans. 67801

Filed Sep. 27, 1976, Ser. No. 726,527
Int. Cl.[2] B65H *75/34, 75/28;* B25D *1/04*
U.S. Cl. 242—85 **1 Claim**



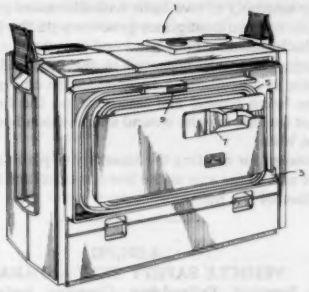
1. A manually driven, removable stake apparatus for anchoring and securing watercraft at an adjustable distance therefrom, said stake apparatus comprising in combination:
a stake having a piercing point at one end thereof and a driving and pulling stake head at the opposite end thereof, said stake head having upper and lower impact surfaces thereon;
sleeve means having upper and lower impact stops at opposite ends thereof for slidably confining said stake head therebetween, whereby said stake may be manually driven into a surface in response to impact between the upper impact surface of said stake head and the upper impact stop of said sleeve means, and may be manually pulled from such surface in response to impact between the lower impact surface of said stake and the lower impact stop of said sleeve means;
flange means disposed radially on said sleeve means for restricting the depth to which said stake may be driven in such surface;
a quantity of line storable on said sleeve means;
means on said sleeve means defining spool means for rotationally receiving and storing said line thereon; and
line hook means secured to and carried by said sleeve means for hooking about said line to prevent, during periods of pulling force against said line, rotation of said sleeve means and thereby to prevent paying out of said hooked line.

4,101,089

INTEGRAL STORAGE ASSEMBLY FOR DETACHABLE POWER CORDS

Richard Culbertson, and Paul J. Klucznik, both of Manlius, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed May 23, 1977, Ser. No. 799,459
Int. Cl.[2] B65H *75/36*
U.S. Cl. 242—85.1 **10 Claims**



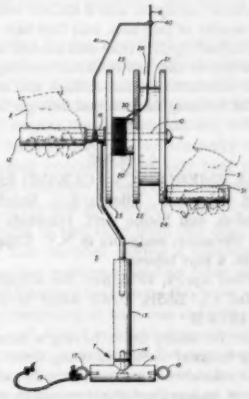
1. A storage assembly for storing on an external surface of a portable electrical device a detachable power cord having male and female ends, comprising:
a. a wrapping surface extending at approximately right angles to said external surface and arranged to provide a closed path on said surface,
b. at least a portion of said wrapping surface having an outwardly projecting overhanging extension disposed approximately parallel to said external surface,
c. first means joined to said external surface for securing the female end of the power cord, and
d. second means joined to said external surface for securing the male end of the power cord, whereby said power cord can be wrapped around said wrapping surface and held in place between said external surface and overhanging extension with its male and female ends secured.

4,101,090

REEL STRUCTURE

Albert L. Wait, Jr., 406 S. Peoria, Tulsa, Okla. 74101

Filed Jul. 21, 1977, Ser. No. 817,562
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—96 **6 Claims**



1. A reel structure with which line is retrieved and discharged, including,

an axle,

a first hub with a finite diameter mounted on the axle for rotating about the axle,

a second hub with the diameter different from that of the first hub and concentrically mounted on the axle for rotation with the first hub,

a first plate captured between the two hubs and mounted to rotate with the hubs as a unit on the axle,

second and third plates, each mounted on the outside ends of the assembly of two hubs with diameters greater than the hubs to form contiguous grooves with the first plate upon which line may be wound and unwound,

retaining structure mounted at the outer edge of the first plate in a position to be actuated to engage and direct a line being wound and unwound on the first of the hubs that the line may be wound and unwound on the second of the hubs,

and means for rotating the assembly of plates and hubs about the axis of the axle as the line is wound and unwound from either of the hubs.

4,101,091

VEHICLE SAFETY BELT APPARATUS

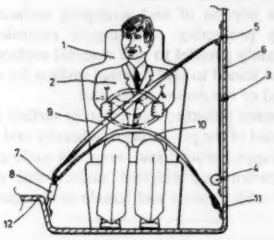
Günter Breitfeld, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed May 20, 1976, Ser. No. 688,487

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2525035

Int. Cl.[2] A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 **4 Claims**



1. In a vehicle safety belt apparatus, including a safety belt winding device, having a spring activated roller for retracting a safety belt, and a safety belt, mounted on said roller and having a first belt portion comprising at least the portion of said safety belt remaining on said roller when said safety belt is applied to a vehicle occupant and a second belt portion comprising the remainder of said belt, said first belt portion having a greater longitudinal rigidity than said second belt portion, the improvement wherein the belt material forming said first belt portion is itself substantially non-resilent and more rigid than the belt material forming said second belt portion.

4,101,092

UNIVERSAL EMERGENCY LOCKING RETRACTOR

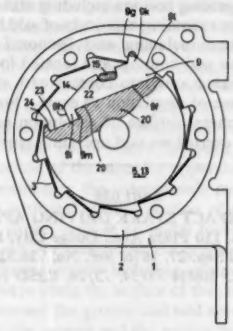
Harald Martin Schmelow, Ellerau/Krs. Segeberg; Per Olof Weman, Hasloh, and Heino Arff, Henstedt-Ulzburg, all of Fed. Rep. of Germany, assignors to N.V. Klippan S.A., Haasrode, Belgium, a part interest

Filed Apr. 9, 1976, Ser. No. 675,406

Int. Cl.[2] B65H *75/48;* A62B *35/02*

U.S. Cl. 242—107.4 B **8 Claims**

1. A retractor for safety belts, having a housing, a locking ring containing internal teeth and being fixed relative to said housing, a shaft rotatably mounted about an axis for retracting an extensible belt, an inertia element rotatably mounted on said shaft and adapted to lag in rotation relative to said shaft upon a predetermined acceleration thereof, a locking element slidably movable in a plane perpendicular to said axis of said shaft, said inertia element having means for moving said locking element relative to said axis in response to said predetermined angular acceleration of said shaft to effect locking engagement between said locking element and said locking ring, said shaft being provided with a partly circular disc having a chord that comprises a linear cam surface, and said locking element com-



prising an internal linear cam-follower surface in sliding engagement with said linear cam surface, said inertia element being in engagement with said locking element to hold said locking element at a constant distance from said axis, whereby said locking element moves in a direction opposite to the direction of rotation of said shaft upon predetermined shaft acceleration to produce locked engagement with said locking ring.

4,101,093

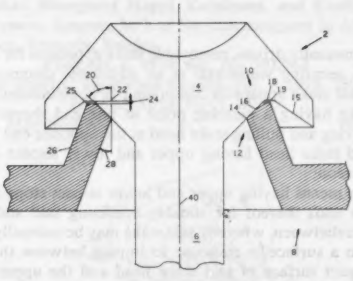
FRICTION DAMPENED PENDULUM SENSOR

Arduino Colasanti, East Detroit, Mich.; Josef M. Cachia, Louvain, Belgium, and Heino Arff, Henstedt-Ulzburg, Fed. Rep. of Germany, assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 11, 1976, Ser. No. 740,909

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **4 Claims**



1. In a safety belt retractor having a pendulum for sensing a change in acceleration, deceleration or orientation of a vehicle in which said retractor is mounted, said pendulum including a substantially circular pendulum head, a pendulum stem connected to a pendulum weight and a substantially circular support for said pendulum head, said pendulum head having an overhang around an outer circumference of said pendulum head, an improvement for avoiding undesired actuation of said pendulum comprising:

a first circumferential contact surface on a portion of an underside of said pendulum head, said first contact surface extending circumferentially around an inner circumference of at least part of said underside of said pendulum

head and extending radially from a point adjacent to said pendulum stem to said overhang;

a second circumferential contact surface on said support; at least part of said first contact surface of said pendulum head resting on at least part of said second contact surface of said support, at least part of said second contact surface supporting said pendulum head;

said first contact surface and said second contact surface each having a circumferential substantially linear inclined portion and a circumferential horizontal portion, said inclined portions disposed at an angle with reference to a vertical line, said horizontal portion of said first contact surface extending outward radially from said inclined portion of said first contact surface to said overhang of said pendulum head, and said horizontal portion of said second contact surface extending outward radially from said inclined portion of said second contact surface to an outer circumference of said second contact surface;

said horizontal portions extending outward radially from an outer circumference of said inclined portions, at least part of said inclined portion of said first contact surface resting on at least part of said inclined portion of said second contact surface, said contact surfaces having a gap between said horizontal portion of said first contact surface and said horizontal portion of said second contact surface; and

said pendulum support comprising an upwardly extending circumferential projection upon which said pendulum head pivots during actuation.

4,101,094

DEVICE FOR USE IN EMERGENCY LOCKING MECHANISM FOR WEBBING-TYPE SAFETY BELTS

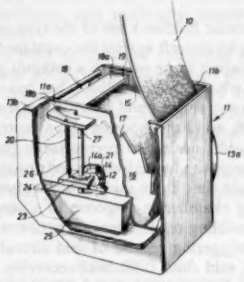
Jan-Olof Wallin, Ellerau, Fed. Rep. of Germany, assignor to Irvin Industries, Inc., Greenwich, Conn.

Filed Nov. 26, 1976, Ser. No. 745,217

Claims priority, application Sweden, Dec. 3, 1975, 7513642; Dec. 3, 1975, 7513643

Int. Cl.[2] A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **12 Claims**



1. A device for use in emergency locking of webbing-type vehicle safety belts, comprising

a frame adapted to be mounted on a vehicle,

a spindle rotatable on said frame and having a webbing-type belt wound thereon,

a locking mechanism on said frame operable to stop rotation of said spindle in a belt-withdrawing direction,

a tension sensing element on said frame movable in response to a predetermined increase in the tension of said belt from a sensing position to a lock operating position where it causes said locking mechanism to operate,

a vehicle-triggered member on said frame responsive to sudden changes in the speed or direction of said vehicle to move from a neutral position to an operative position in which it operates during withdrawal of said belt to effect said predetermined increase in the tension in said belt and to cause said tension sensing element to be moved to its lock operating position,

a spring urging said vehicle-triggered member from its neutral position toward its operative position, and

means including an inertia element releasably holding said vehicle-triggered member in its neutral position, and responsive to sudden changes in the speed or direction of said vehicle to release said member,

said tension sensing element being operative, when moved to its lock operating position by release of said vehicle-triggered member from its neutral position, automatically to return said vehicle-triggered member to its neutral position.

4,101,095

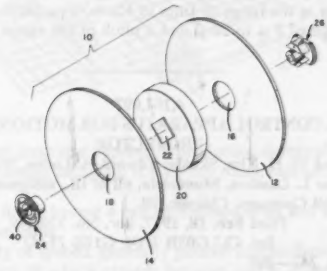
ADJUSTABLE AND EXPANDABLE SPOOL OR REEL ASSEMBLY

Clyde Thomas Carter, Shermans Dale, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 24, 1977, Ser. No. 809,741

Int. Cl.[2] B65H *75/22, 75/14*

U.S. Cl. 242—115 **8 Claims**



1. An expandable spool or reel assembly comprising:

a pair of rigid sidewall members each having a central aperture;

a spacer member having a profiled central aperture; and

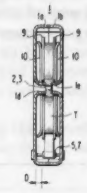
a mating pair of inner and outer hub members, each said hub member having a base portion receivable in a respective one of said apertures of said sidewalls and a radial flange adapted to engage the surrounding sidewall member, said outer hub member having a substantially cylindrical portion extending coaxially from said base portion, a bore through said cylinder, at least one inwardly directed arcuate flange at the free end thereof, and an abutment extending the length of said bore from one edge of said flange, said inner hub member having a substantially centrally located locking portion extending from said base with a plurality of interrupted rings on the outer surface thereof, each ring comprising at least one radially extending arcuate flange, and at least one keying member extending from said base portion and profiled for engagement in the central aperture of said spacer member, whereby said arcuate flanges of said inner member are passed between the arcuate flanges of the outer member and the hub members rotated relatively to bring said arcuate flanges into locking engagement.

4,101,096

MAGNETIC TAPE CASSETTE

Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Sep. 15, 1976, Ser. No. 723,369
Claims priority, application Japan, Sep. 17, 1975, 50-112451
Int. Cl.[2] G03B *1/04*; G11B *15/32, 23/04*
U.S. Cl. 242—199 **7 Claims**



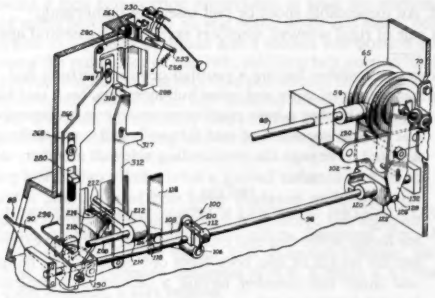
1. In a magnetic tape cassette unit of the type having at least one reel therein for reeling and unreeling a magnetic tape thereon, said reel being disposed in a housing having an upper wall and a lower wall confining said tape, the improvement comprising a plurality of elastically tensioned sheets, each having embossed projections projecting from a surface thereof, said projections positioned on said surface to press the tape edges along an axis parallel to the axis of said reel to maintain said tape in preferred position in the width direction thereof, said sheets being curved at a radius of curvature to elastically urge said projections against said tape edges, and wherein: said sheets each having a thickness in the range of 50 μ to 150 μ and said embossed projections have an overall diameter in the range of 1mm to 10mm, a projection height in the range of 5 μ to 20 μ and a pitch in the range of 1mm to 10mm.

4,101,097

DRIVE CONTROL APPARATUS FOR MOTION PICTURE PROJECTOR

Raymond W. H. Kim, Skokie; Edward H. Lodge, Wilmette, and Arthur L. Lueders, Mundelein, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 770,249
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—205 **20 Claims**



1. A drive control mechanism for selectively actuating a motion picture projector to several operational modes to transport film between a supply device and a take-up device, the drive control mechanism comprising:

means positionable in a plurality of positions for selecting projector operating modes including means for translating said plurality of positions into corresponding predetermined axial and rotational positions and movements;

means having a unidirectional input and being coupled to said supply device and said take-up device for selectively driving said supply device and said take-up device, said selective driving means including a dual clutch assembly arranged for continuous engagement with said unidirectional input and means provided for each of said clutch assemblies of said dual clutch assembly for actuating a respective one of said clutch assemblies of said dual clutch assembly, each of said clutch actuating means being positionable in at least a first position corresponding to said respective clutch assembly being in a free, non-actuated drive condition and a second position corresponding to said respective clutch assembly being in an engaged drive condition;

means selectively and simultaneously engaging each of said clutch assemblies for braking operation of said supply and take-up devices;

means coupled to said position translating means for controlling each of said clutch actuating means; and

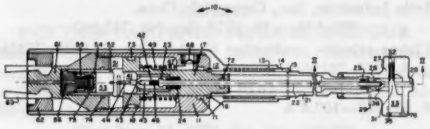
means coupled to said position translating means for controlling said braking operation means to be simultaneously applied to each of said clutch assemblies during predetermined operating modes for stabilizing the film transport between the supply and take-up devices.

4,101,098

STRAIN ACTUATED HYDRAULIC HOLDBACK BAR

William H. Hickle, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,414
Int. Cl.[2] B64F *1/06, 1/12*
U.S. Cl. 244—63 **8 Claims**



1. In a hydraulic holdback bar of the type used for temporarily restraining an aircraft against the combined forces of engine thrust and catapult force prior to a catapult assisted launch of said aircraft, wherein said holdback bar has means for attachment to a runway surface and means for releasable attachment to said aircraft, and has a housing and a central plunger operative within said housing to pressurize a fluid in a pressure chamber in response to said combined forces, and has means for venting said fluid from said pressure chamber into a separate receiving chamber in response to a predetermined combined force enabling relative motion between said plunger and housing for triggering release of said aircraft, and has means for returning said fluid from said receiving chamber to said pressure chamber to reset said holdback bar for additional launches, the improvement comprising:

said plunger defining a resilient hollow shank and having a longitudinal axis;

said venting means comprising a valve having a body and a head, said valve body being attached to said plunger and defining a first passageway communicating between said pressure chamber and said receiving chamber, said valve head being movable along said longitudinal axis between open and closed positions, and operative in said closed position with said valve body to close said first passageway, said valve head being resiliently biased toward said closed position;

an elongated triggering rod having first and second ends, said first rod end engaging said valve head and operative to move said valve head from said closed position to said open position in response to tensile force within said rod, and said rod extending within said hollow shank to said

second rod end at a location spaced from said valve head; and

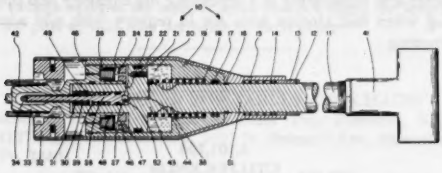
means for applying tensile force to said triggering rod in reponse to said predetermined combined force.

4,101,099

REPEATABLE RELEASE HOLDBACK BAR

William H. Hickle, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,425
Int. Cl.[2] B64F *1/06, 1/12*
U.S. Cl. 244—63 **5 Claims**



1. In a repeatable release holdback bar of the type used for temporarily restraining an aircraft against the combined forces of engine thrust and catapult force prior to a catapult assisted launch of said aircraft, wherein said holdback bar has means for attachment to a runway surface and means for releasable attachment to said aircraft, and has a housing and a central plunger operative within said housing to pressurize a fluid in a pressure chamber in response to said combined forces, and has means for venting said fluid from said pressure chamber into a separate receiving chamber in response to a predetermined combined force level to enable relative motion between said plunger and housing for triggering release of said aircraft, and has means for returning said fluid from said receiving chamber to said pressure chamber to reset said holdback bar for additional launches, the improvement comprising:

said plunger defining a bore separate from said pressure chamber and said receiving chamber;

a piston sealingly slidable within said bore between closed and open positions, and resiliently biased toward said closed position;

said piston and bore defining an unloading chamber; said venting means comprising said plunger defining a first passageway communicating between said pressure chamber and said unloading chamber, and a second passageway communicating betwen said unloading chamber and said receiving chamber; and

a sphere contained within said unloading chamber and cooperating with said piston in said closed postion to seal said first passageway.

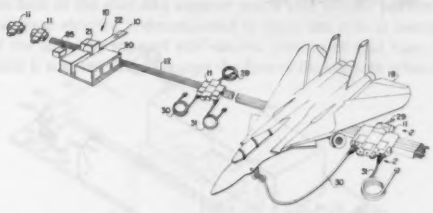
4,101,100

AIRCRAFT FLIGHT LINE SERVICING SYSTEM

David W. Smith, Alexandria, Va.; Raymond C. LeBlanc, Potomac, and J. Allen Oliver, Silver Spring, both of Md., assignors to Value Engineering Company, Alexandria, Va.

Filed Jul. 28, 1976, Ser. No. 709,318
Int. Cl.[2] B64F *1/28, 1/34*
U.S. Cl. 244—114 R **6 Claims**

1. An aircraft flight line servicing system comprising a source of electrical energy having an electrical output at a predetermined voltage and frequency, an air compressor unit having an air output, a plurality of air and electrical distribution lines connected to said air and electrical outputs and positioned upon the flight line surface, a ramp having sloping longitudinal edges disposed over said air and electrical distribution lines and having a height of about 3.5 inches to enable aircraft tires to pass thereover, a plurality of service islands disposed on the flight line surface serially connected to all of said air and distribution lines and to said ramp and spaced apart a distance sufficient to accommodate two aircraft between successive islands, each island having a maximum height of



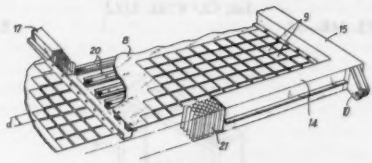
about 4.5 inches and a tapering configuration so that an aircraft can taxi over the island, each island having air and electrical connections thereon to service aircraft.

4,101,101

SOLAR GENERATOR

Gérard Barkats, Mandelieu-la-Napoule; Claude Chenin, Cannes-la-Bocca; Jean Foucras, Mougins, and Louis Marnay, Mouans Sartous, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 28, 1977, Ser. No. 791,932
Claims priority, application France, May 3, 1976, 76 13098
Int. Cl.[2] B64G *1/10*
U.S. Cl. 244—173 **14 Claims**



1. A solar generator capable of producing electrical energy from solar energy including at least one panel, said panel comprising:

an open frame having a pair of opposed sides and a pair of opposed ends;

a plurality of spaced, generally parallel intermediate stiffeners, each of which extends between and is connected to said sides;

a plurality of spaced, generally parallel auxiliary stiffeners transverse to and extending between adjacent intermediate stiffeners and between a stiffener and an adjacent one of said ends;

said frame and said intermediate stiffeners each comprising two mirror image sub-assemblies fastened together, each sub-assembly having a cross-section including a central cavity and a flange adjacent each edge thereof, said subassemblies being positioned with their flanges in contact;

a thin flexible sheet-like support disposed within said frame and at least partially fixed to said auxiliary stiffeners; and

a plurality of solar cells carried on said flexible support.

4,101,102

VIBRATION ISOLATION LOAD SUPPORT APPARATUS

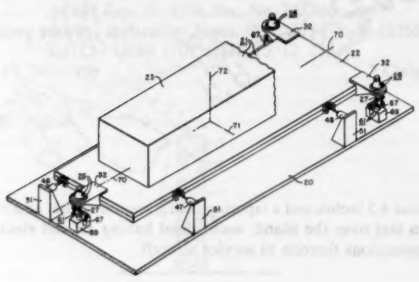
Wayne B. Lloyd, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1976, Ser. No. 680,255
Int. Cl.[2] F16F *15/04, 11/00*
U.S. Cl. 248—20 **4 Claims**

1. Load support apparatus comprising a vibration-prone mounting member and a load-bearing mounted member,

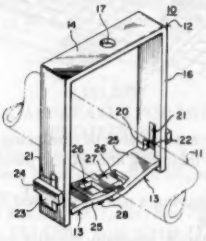
a plurality of vertically-movable four-axis joint means carried by said mounting member and supporting said

mounted member at horizontally spaced apart locations with freedom for relative movement between the two members in the vertical, longitudinal, lateral, roll, pitch, and yaw modes, and



actuator means for effecting active vibration isolation in each of the aforesaid modes.

4,101,103
CRADLE TYPE CONDUIT HANGERS
Thomas Mooney, Mt. Sinai, and Sami Shemtov, Central Islip, both of N.Y., assignors to I.T.E. Imperial Corporation, East Farmingdale, N.Y.
Continuation of Ser. No. 591,408, Jun. 30, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,011
Int. Cl.[2] F16L *3/12*
U.S. Cl. 248—58 **8 Claims**



1. A conduit hanger comprising an overhead bracket including a pair of laterally spaced depending legs delineating an access opening between their lower portions, and gate means supported by said bracket, and movable between a depressed closed position restricting said access opening and a raised open position providing access through said opening, said gate means being normally urged toward its closed position and being movable to its open position in response to an upward pressure thereon, said bracket legs being substantially coextensive and having pivot openings formed proximate their lower ends, said gate means comprising a closure arm extending from each of said legs toward the other leg and including a reduced width shank proximate its outer end rockably engaging a respective pivot opening and provided with an upwardly directed lug terminating in a stop section defining a transverse stop member engaging the outer face of the corresponding bracket leg when said closure arm is in said depressed closed position.

6. A conduit hanger comprising an overhead bracket including a pair of laterally spaced depending legs delineating an access opening between their lower portions, gate means supported by said bracket and movable between a depressed closed position restricting said access opening and a raised open position providing access through said opening, said gate means being normally urged toward its closed position and being movable to its open position in response to an upward pressure thereon, and comprising a closure arm swingably supported by and extending from each of said bracket legs toward the other said bracket legs and disposed across said access opening in overlapping relation when said gate means is in its closed position and each being upwardly swingable in response to an upward pressure thereon to receive a conduit, and means for restricting the downward swinging of each of said closure arms including stop sections located on each closure arm and its corresponding bracket leg and movable into mutual abutting engagement when said closure arms swing to their closed overlapping position to prevent further depression thereof and support the conduit, at least one of said closure arms having an opening therein proximate its inner end and the other arm terminating in a depending lug engaging said opening when said closure arms are in registry with said access opening.

4,101,104
UTILITY KNOB
Marguerite F. Minard, Wenatchee, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Dec. 14, 1976, Ser. No. 750,470
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—95 **1 Claim**

1. A knob for mounting to a flat surface which serves as a hanger for a litter bag, said knob formed of a shaft joined at one shaft end to a first disc and to the opposed shaft end to a second circular disc, with

the external surface of the first circular disc coated with a self-adhering plastic material, and with

the external surfaces of the second circular disc formed as a continuous convex surface,

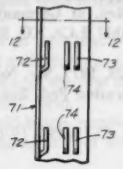
said disc generally oriented along parallel planes together with

a litter bag formed with a tab section, said tab section shaped with a circular hole of substantially the diameter of the diameter of the knob shaft, said hole intersected by a pair of opposed slots that extend a total distance of the general diameter of the second circular knob disc, with the width of each slot being substantially the maximum thickness of the said second circular knob disc, to permit the tab section of the litter bag to be readily detachably mounted to the knob.

4,101,105
SHELVING STRUCTURE
Guy J. DiCenzo, 5650-C Via Romano, Charlotte, N.C. 28211
Division of Ser. No. 599,767, Jul. 28, 1975. This application Dec. 27, 1976, Ser. No. 754,331
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—158 **1 Claim**

1. A supporting post for shelving structure, which is right angular in cross-section, both of the legs thereof having up-

wardly pointing prongs on their inner sides and one of the legs also having an upwardly pointing prong on its outer side, all of



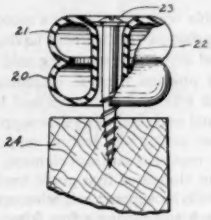
the prongs being at the same relative distance along the length of the post so that they are aside of each other.

4,101,106

CUSHION LEVELER FOR TABLES AND CHAIRS

Marian C. Denkinger, 88-35 Elmhurst Ave., Elmhurst, N.Y. 11373, and Kemal Batova, 1607 N. Belmore Ave., Staunton, Va. 24401

Filed Apr. 27, 1976, Ser. No. 680,881
Int. Cl.² F16M *11/20*
U.S. Cl. 248—188.9 **1 Claim**



1. A device for levelling a piece of furniture, such as a table or chair, on a floor, so that the piece of furniture will maintain a stable equilibrium relative to unevenness in the piece of furniture or the floor comprising;

a double torus-shaped closed blister being filled with air, said blister being formed of deformable plastic material having an elastic lag with a memory of its formed shape, said blister having upper and lower faces;

means for attaching said blister to a foot of a piece of furniture with one of its faces in abutment therewith; and

said blister having a central diametrical opening extending therethrough and said device additionally including a screw receivable and mountable within said opening for attaching said blister to a foot of a piece of furniture.

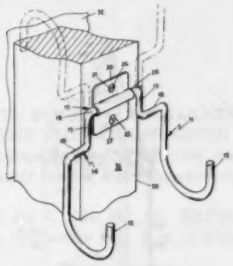
4,101,107

FOLDING WALL BRACKET

Alex Joseph Antoszewski, Michigan City, Ind., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed Sep. 13, 1976, Ser. No. 722,810
Int. Cl.² F16M *13/02*
U.S. Cl. 248—218.4 **6 Claims**

1. A bracket adapted to be mounted on the narrow face of a stud-like support, said bracket having a plate-like base piece adapted to seat against and be secured to the narrow face of said support, the improvement in said bracket comprising: a one-piece article engaging member having an arm, a base element extending from said arm, said base element having a first portion and a second portion generally normal to said first portion and when said member is in extended position extending generally parallel to the plane of the base piece and a third element extending from the end of the second element generally parallel to said first portion and joined to the arm, said first portion pivotally secured to said base piece, the second portion of the base element being adjacent the base piece and the base element being dimensioned to space the arm away from the base piece whereby if said base is dimensioned narrower than the face of the stud-like support and if said second portion of said base element is dimensioned to space the arm to one side of the stud-like support said second portion of said base element is adapted to rest against the face of the support when the



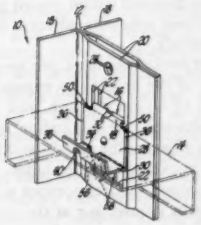
member is in extended operating position and the arm will be above the base piece with the arm seated on one side of the support when the member is in retracted storage position, the center of gravity of the member in extended position biasing if forwardly and downwardly and the center of gravity of the member biasing it rearwardly when the member is in retracted position.

4,101,108

SHELF CLIP

Thomas A. Klein, Plainwell, Mich., assignor to Lear Siegler, Inc., Kalamazoo, Mich.

Filed Jun. 6, 1977, Ser. No. 803,711
Int. Cl.² A47G *29/02*
U.S. Cl. 248—243 **5 Claims**

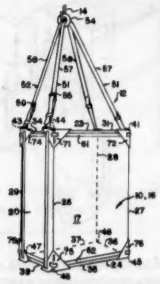


1. A shelf clip comprising a clip body having a vertically extending attachment flange with opposite lateral sides and upper and lower ends, a support flange extending horizontally from the lower end of the attachment flange to support a shelf thereon, a lower positioning tang at the lower end of the attachment flange to one side or the other of the center between the lateral sides thereof, said positioning tang being struck from the support flange so as to extend downwardly from the attachment flange and horizontally therefrom in the opposite direction as the shelf support flange, and an upper support hook at the upper end of the attachment flange located to one side or the other of the center between the opposite lateral sides of the attachment flange.

4,101,109
LOUDSPEAKER HARNESS

Aubrey John Edwards, 7987 Gilley Ave., Burnaby, British Columbia, Canada

Filed Dec. 14, 1976, Ser. No. 750,522
Int. Cl.[2] B65C 1/12
U.S. Cl. 248—317 5 Claims



1. A loudspeaker harness for supporting a loudspeaker, the loudspeaker including a housing having: at least four generally vertical walls, namely front and rear walls and a pair of spaced side walls, and two horizontal walls, namely top and bottom walls, the walls intersecting at four generally vertical edges and eight generally horizontal edges; the housing also having at least eight corners, each corner being positioned at an intersection between two horizontal edges and one vertical edge; the harness being characterized by:

(a) first and second longitudinal links passing under the bottom wall of the housing and extending upwardly adjacent opposed vertical walls, at least one link extending to an upper link portion adapted to cooperate with a support to hang the loudspeaker therefrom,

(b) upper and lower circumferential links passing around the four vertical walls to form two loops enclosing the housing and being disposed within spaced generally horizontal planes positioned generally adjacent the top and bottom walls respectively,

(c) eight corner pocket members, one member being fitted at each corner of the housing to engage the corner of the housing and to cooperate with, and to restrict relative movement between, one longitudinal link and one circumferential link adjacent the particular corner, and in which each corner pocket member includes:

(i) first and second vertical portions to fit against the two vertical walls intersecting at the corner, each vertical portion having an opening having a size sufficient to accept the circumferential link threaded therethrough so as to form circumferential link engaging means,

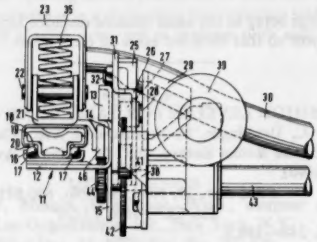
(ii) a horizontal portion to fit against the horizontal wall intersecting the two vertical walls at the particular corner, the three portions intersecting each other along sides thereof to form a pocket generally complementary to the corner of the housing to restrict movement of the housing relative to the links,

(iii) a tang extending outwardly from an intersection of the horizontal portion with one vertical portion, the tang having an opening therein to form a longitudinal link engaging means to accept the longitudinal link threaded therethrough, so as to maintain the links in a desired position relative to the housing.

4,101,110
MOUNTING ARRANGEMENT FOR AN ADJUSTABLE VEHICULAR SEAT

Hans Werner Voss, Wuppertal, and Bernd Klüting, Radevormwald, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Jul. 28, 1977, Ser. No. 819,828
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634529
Int. Cl.[2] A45D 19/04
U.S. Cl. 248—395 12 Claims

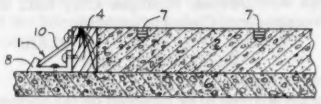


1. In an adjustable seat, particularly a motor vehicle seat, a combination comprising a seat element having front, rear and lateral regions; and means for mounting said seat element for adjustment of the position thereof, including two mounting arrangements each arranged at one of said lateral regions of said seat element and each including first support means associated with said front region and second support means associated with said rear region of said seat element, said first support means including an elongated first guide track extending substantially horizontally, a support rail telescopically guided on said first guide track and having a free front end, and a pivot connecting said front region of said seat element to said front end of said support rail for pivoting relative thereto, said second support means including an elongated second guide track which is inclined upwardly in the forward direction, and a support member connected to said rear region of said seat element and supporting the latter on said second guide track, said second support means being arranged laterally adjacent said first support means.

4,101,111
BLOCK AND BRACE ASSEMBLY

Byron Norman Bishop, 4121 Casa Loma, Yorba Linda, Calif. 92686

Continuation-in-part of Ser. No. 747,157, Dec. 3, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,648
Int. Cl.[2] B28B 17/00
U.S. Cl. 249—205 20 Claims



1. A block and brace member assembly to support a mold form during the formation of a present panel within said mold form, said block and brace member assembly including:

a block member comprising a plate means and first and second arms connected to respective first and second ends of said plate means, each of said arms being angled with respect to said plate means,

the first angled arm of said block member adapted to be connected to said mold form, and

a brace member comprising a plate means and at least a first arm connected to one of first and second ends of said brace member plate means, the first arm of said brace member being angled with respect to said brace member plate means,

the first angled arm of said brace member adapted to be connected to said mold form at a point above the corresponding connection of the first angled arm of said block member to said mold form,

the second end of said brace member plate means received by the second angled arm of said block member plate means.

4,101,112

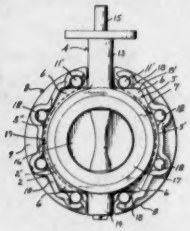
PIPE LINE COUPLING SYSTEM

John A. Conners, 510 Main St., Bridgeport, Conn. 06604, and Hyman Posner, 61-16th St., Roxboro, Canada

Division of Ser. No. 744,704, Nov. 24, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,146

Int. Cl.² F16K *1/22*

U.S. Cl. 251—148 **2 Claims**



1. A clamp for securing in fluid-proof manner a wafer type butterfly valve to the radially outwardly extending annular coupling flange at the end of a pipe, said coupling flange having a series of equally spaced bolt receiving apertures arranged in a circle around the pipe, said wafer type butterfly valve being of the type including a generally circular flat valve body having opposite flat end faces, a radially projecting bonnet and a diametrically opposite boss aligned along a common axis, said valve body further including an apertureless wafer flange projecting from the middle plane of said body and having opposite flat faces parallel to and recessed from the respective flat end faces of said valve body, said wafer flange forming two diametrically opposite flange portions each having two straight end edges and an intermediate arcuate edge, said straight end edges making an angle with said arcuate edge, each of the two straight end edges of one flange portion being aligned with a corresponding straight end edge of the other flange portion and extending along a line substantially perpendicular to said common axis, said two flange portions adapted to clear said bolt receiving apertures, said clamp including two separate clamp members each engageable with a flange portion of said valve body on one side of said bonnet and said boss, each clamp member being a mirror image of the other and including a flange section and a collar section rigid with said flange section and substantially perpendicular thereto, said flange section being flat and of arcuate shape and adapted to overlap a flange portion of said valve body and to extend around said valve body, said flange section having a thickness smaller than the axial distance between a flat end face of said valve body and the corresponding recessed flat face of said valve body flange portion, each flange section having a series of equally spaced bolt receiving holes adapted to register with half the number of bolt receiving apertures of said coupling flange, said collar section forming an inner arcuate surface complementary with and adapted to closely surround said arcuate edge of said flange portion and, at both ends of said inner arcuate surface and making an angle therewith, a straight surface adapted to closely extend along the corresponding straight end edges of said flange portions, said collar section clearing the bolt receiving holes of said flange section.

4,101,113

STOPCOCK WITH ROTARY AND ADJUSTABLE PLUG IN THE STOPCOCK HOUSING

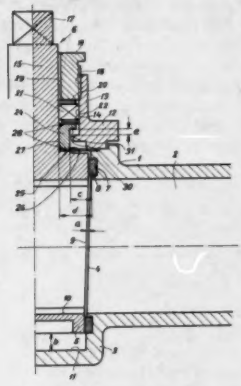
Kurt Plessing, Lindau, Fed. Rep. of Germany, assignor to Fördertechnik Streicher GmbH, Bad Schussenried, Fed. Rep. of Germany

Filed Jul. 6, 1976, Ser. No. 702,724

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1975, 2529641

Int. Cl.² F16K *5/00*

U.S. Cl. 251—214 **9 Claims**



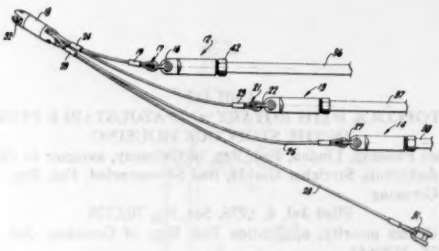
1. A stopcock comprising in combination, a housing; a rotary and adjustable plug in said housing; a fixedly mounted liner of flexible material with a substantially smooth sliding surface at a bottom part of said housing; a shaft member displaceable for controlling the flow through said stopcock; a packing disk clamped at its outer edge to said housing and pressed tightly at its inner periphery to an upper surface of the said plug; a gasket located in a cylindrical annular space formed between said shaft member and a wall of said housing; a reset member projecting into the annular space, said reset member being reciprocably received in said annular space for resetting the stopcock, a reset force of said reset member acting via said gasket and packing disk on the stopcock bottom part for resetting in a conical seat,in said liner; a fixed stop on said housing, a substantially rigid ring-shaped member movable reciprocably in said annular space in response to reciprocable movement of said reset member, said fixed stop limiting the reciprocable movement, said gasket being enclosed on all sides and acting onto said packing disk through said ring-shaped member; said ring-shaped member having a reciprocable path between said reset member and said plug limited in the reset direction by said fixed stop, said ring-shaped member transmitting reset forces to said plug, said ring-shaped member being stopped by said fixed stop when said liner has received a predetermined amount of wear, further reciprocation by said reset member compressing further said gasket.

4,101,114

CABLE PULLING SYSTEM

Bernard L. Martin, San Rafael, and Bruce N. Vogel, South San Francisco, both of Calif., assignors to Carpenter Rigging and Supply Company, Inc., San Francisco, Calif.

Filed Oct. 12, 1977, Ser. No. 841,306
Int. Cl.[2] E21C 29/16
U.S. Cl. 254—134.3 FT 6 Claims



1. A system for pulling electrical cables through a conduit comprising

a plurality of gripping means adapted to positively engage the ends of electrical cables in axial extension therefrom,

a swivel connector adapted to engage a line for drawing the system through a conduit, and

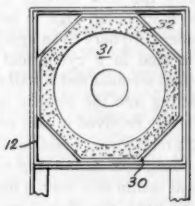
flexible connecting means having looped ends connected to said swivel means and said gripping means with lengths intermediate said looped ends being different to dispose said gripping means apart, at least the length of a gripping means.

4,101,115

CRASH CUSHION

Lester N. Meinzer, 4331 Sierra Madre Dr., Sacramento, Calif. 95825

Filed Feb. 3, 1977, Ser. No. 765,290
Int. Cl.[2] A01F 3/00
U.S. Cl. 256—13.1 6 Claims



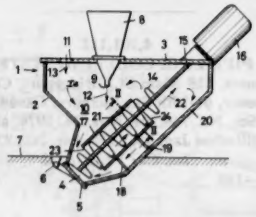
1. A crash cushion barrier comprising a plurality of cushions aligned in a linear series, one behind the other, means for securing said cushions to a concrete base, a frame disposed within each of said cushions, a tapering conical void within said frame oriented so that its open largest end is at the forward end of the cushion, a compressible material between said conical void and said frame formed from aerated vermiculite plaster of paris and portland cement wherein the frame is octagonal and strengthened by fiberglas threads wrapped around the outside so as to retain the compressible material.

4,101,116

APPARATUS FOR MIXING GRANULATED AND/OR PULVEROUS MATERIALS

Franz Haag, Isny, and Paul Bongartz, Isny-Kleinhaslach, both of Fed. Rep. of Germany, assignors to MOTAN Gesellschaft mit beschränkter Haftung, Isny, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,620
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545078
Int. Cl.[2] B01F 7/00, 15/02
U.S. Cl. 366—142 12 Claims



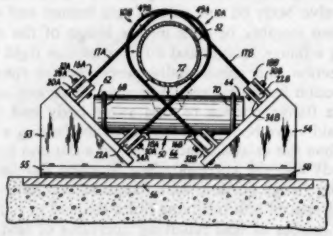
1. An apparatus for mixing granulated and pulverous materials including synthetic materials and dye stuff which comprises: a housing defining a mixing chamber for receiving material to be mixed, said housing comprising wall means inclined in normal position of said apparatus relative to a horizontal plane, said housing also having means for introducing said material to be mixed into said mixing chamber, and also having outlet means for releasing intermixed materials from said mixing chamber, mixing means rotatably arranged within said housing for cooperation with at least a portion of said wall means so as to form a gap therewith for conveying said material to be mixed along said gap against the force of gravity in response to the rotation of said mixing means in the desired mixing direction, said inclined wall means including a hollow cylindrical body arranged within said housing and at least partially surrounding the operative portion of said mixing means, a portion of said inner surface of said hollow cylindrical body defining a portion of said gap.

4,101,117

IMPACT ENERGY ABSORBING PIPE RESTRAINTS

George H. East, Jr., Randolph; Norman A. Goldstein, Framingham; John M. Peech, Cambridge; Shelden D. Pirotin, Melrose; Robert E. Roemer, Brighton, and Albert J. Spada, Wilmington, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 7, 1976, Ser. No. 703,229
Int. Cl.[2] F16F 7/12; F16L 3/00
U.S. Cl. 267—136 6 Claims



1. A pipe restraint for absorbing the impact energy of a ruptured high energy pipe and restraining movement thereof in at least one direction, comprising:

a restraining pipe of a short length positioned adjacent the

high energy pipe and arranged transversely to the longitudinal axis of the high energy pipe to absorb the impact energy of the ruptured high energy pipe and restrain its movement upon encountering and crushing said restraining pipe, said restraining pipe having ends which are free to move upward from the longitudinal axis of the restraining pipe so that as the restraining pipe is being crushed under the impact energy of the ruptured high energy pipe, a well is formed in the restraining pipe which aids in preventing lateral movement of the high energy pipe relative to the restraining pipe;

support means for supporting said restraining pipe adjacent the high energy pipe; and

coupling means for coupling said restraining pipe to said support means.

4,101,118

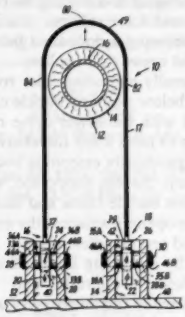
IMPACT ENERGY ABSORBING PIPE RESTRAINTS

Elia A. Mottola, North Andover; George H. East, Jr., Randolph; Norman A. Goldstein, Framinghan; Wu-Cheng Huang, North Reading; Robert E. Roemer, Brighton, and Albert J. Spada, Wilmington, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 7, 1976, Ser. No. 703,230

Int. Cl.[2] F16F *7/12*; F16L *3/00*

U.S. Cl. 267—136 **12 Claims**



1. A pipe restraint for absorbing the impact energy of a ruptured high energy pipe and restraining movement thereof in at least one direction, comprising:

a laminated strap formed of a plurality of strips which are unattached to one another and are secured only at their respective ends, with each strip being substantially of the same longitudinal length and each comprising a material having the property of substantial elongation in the plastic state for absorbing the impact energy of a ruptured high energy pipe in at least one direction, said laminated strap being shaped to extend circumferentially around at least a portion of the high energy pipe with an arcuate portion formed therein positioned adjacent the high energy pipe and spaced therefrom to restrain movement of the ruptured high energy pipe in the direction of said arcuate portion; and

anchoring means coupled to the ends of said laminated strap for anchoring said laminated strap to supporting structure.

4,101,119

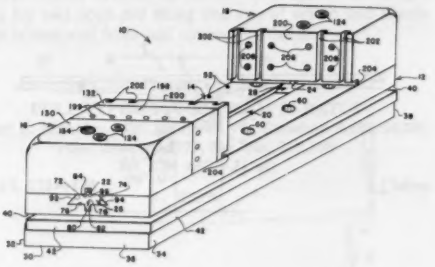
FLUID-OPERATED VISE

Arthur S. Speiser, 4400 Clarkwood Pkwy., Warrensville Hts., Ohio 44128, and Samuel G. Sheterom, Jr., 25 Wintergreen Hill, Painesville, Ohio 44077

Filed Nov. 16, 1977, Ser. No. 851,839

Int. Cl.[2] B25B *1/02*

U.S. Cl. 269—203 **10 Claims**



1. A fluid-operated vise, comprising:

(a) an elongate base structure having a top surface and an undercut groove including inclined surface portions, the undercut extending substantially the full length of and opening through the top surface;

(b) first and second jaw means supported on the top surface and being movably positionable therealong for gripping a workpiece therebetween;

(c) first and second downwardly facing elongate grooves provided, respectively, in bottom portions of the first and second jaw means, the first and second downwardly facing grooves being of substantially identical cross-section and communicating along their lengths with the undercut groove as the first and second jaw means are positioned along the length of the top surface;

(d) first and second elongate key members each having lower cross-sectional portions configured to correspond to the undercut cross-section of the undercut groove and being positioned therein, and each having upper cross-sectional portions configured to correspond to the cross-section of the downwardly facing grooves and being positioned therein, whereby the key members maintain alignment of the first and second jaw means and the base structure as the jaw means are positioned along the length of the top surface;

(e) first and second clamping means for clamping the first and second key members into engagement with the inclined surface portions to releasably retain the first and second jaw means in place at selected positions along the length of the top surface; and,

(f) one of the jaw means including:

(i) a first component operably engaged by the first clamping means and adapted to be secured by the first clamping means at a first selected position along the length of the top surface;

(ii) a second component movably connected to the first component for relative movement in directions toward and away from the other jaw means;

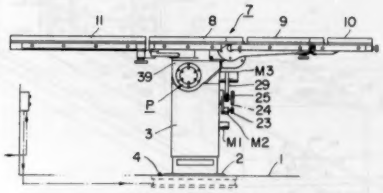
(iii) fluid-operated actuator means interposed between the first and second components for moving the second component relative to the first component in a direction toward said other jaw means; and,

(iv) biasing means interposed between the first and second components for biasing the second component toward the first component in a direction away from said other jaw means.

4,101,120
ELECTRICALLY DRIVEN, SEPARATE TYPE, SURGICAL OPERATION TABLE

Kensuke Seshima, Tokyo, Japan, assignor to Mizuho Ika Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1977, Ser. No. 793,911
Claims priority, application Japan, Aug. 10, 1976, 51-94538
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—323 9 Claims



1. In an electrically driven, separate type, surgical operating table comprising an upper structure for supporting the body of a patient, a lower structure including support means for supporting the upper structure in a detachable manner, first drive means for moving said support means vertically relative to other parts of the lower structure, second drive means for rotating said support means about longitudinal and transverse axes of the operating table, guiding means for bringing the upper structure and said support means of the lower structure into predetermined relative positions, said guiding means comprising at least one combination of a first guide member carried by said support means and a second guide member carried by said upper structure, one of said guide members being a guide pin and the other guide member being a guide bush, and the operating table also comprising locking means for locking the upper structure onto said support means of the lower structure, the improvement wherein

(a) said first and second guide members are respectively combined with first and second mating parts of an electric connector which establishes electric connection between said mating parts when said first and second guide members are fully engaged, the first part of the connector being connected to an electric power source,

(b) said locking means comprises at least one combination of a first threaded member provided in said support means and a second threaded member provided in said upper structure, one of said threaded members being a locking screw and the other threaded member being a nut which is threadedly engageable with said locking screw,

(c) said upper structure supports therein third drive means for driving said second threaded member relative to said first threaded member for locking and unlocking operation between said support means of the lower structure and said upper structure

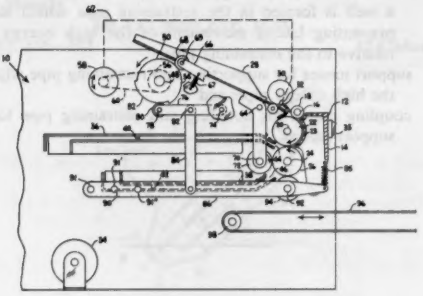
(d) said upper structure supports therein fourth drive means for adjusting the upper structure itself independently of the lower structure, said third and fourth drive means being electrically operable and being connected to the second part of the electric connector whereby, when said first and second guide members are fully engaged, said third and fourth drive means are connected to the power source through said connector, and

(e) circuit means are provided to cause said third drive means to become operative for the locking and unlocking operation at a predetermined vertical position of said support means of the lower structure, while causing said first drive means to become inoperative.

4,101,121
DOCUMENT FOLDING APPARATUS

Andrew Wladimir Rastorguyeff, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 9, 1977, Ser. No. 766,899
Int. Cl.[2] B65H *45/14*
U.S. Cl. 270—68 A 8 Claims



1. A document folding apparatus comprising:

a. a longitudinal extending housing;

b. a pair of drive rollers disposed within said housing adjacent one another to form a nip therebetween, the axis of said drive rollers being parallel to one another and disposed one above the other;

c. means for providing drive to at least one of said drive rollers;

d. a first idler roller supported by said housing above the upper roller of said pair of drive rollers to form a nip therebetween;

e. a first buckle chute having an adjustable stop supported within said housing and having an opening adjacent the nip between said drive rollers;

f. means for delivering a document between said first idler roller and said upper drive roller;

g. a second laterally extending idler roller disposed within said housing below said first buckle chute and in horizontal alignment with the lower drive roller of said pair of driver rollers to form a nip therebetween;

h. a second longitudinally extending buckle chute having an adjustable stop therein supported within said housing below said first buckle chute and said second idler roller and having an opening adjacent the nip of said lower drive roller and said second idler roller;

i. a third laterally extending idler roller located below and ajacent said lower drive roller; and

j. means responsive to the thickness of a document for varying the distance between said second idler roller and said lower drive roller and said third idler roller and said roller lower drive roller prior to the delivery of a document to said second roller and said lower drive roller.

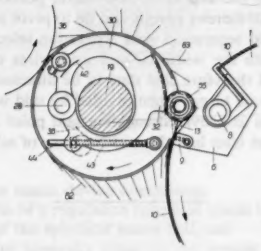
4,101,122
SHEET TURN-OVER DEVICE FOR A FIRST-FORM PRINTING AND PERFECTING PRESS WITH CLAMPING GRIPPERS

Willi Jeschke, Heidelberg, and Arno Wirz, Bannental, both of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Continuation of Ser. No. 562,824, Mar. 28, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 648,913
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1974, 2414998
Int. Cl.[2] B41F *21/04*
U.S. Cl. 271—277 7 Claims

1. Sheet-turn over device for a one-side printing and perfecting press with clamping grippers pivotable about a rotary axis

and mounted in a sheet turn-over cylinder so as to be adjustable from single-side printing to one-side printing and perfecting comprising a gripper shaft coextensive with the rotary axis about which the clamping grippers are pivotable, a gripper tube coaxially disposed on said gripper shaft, and separate control means for respectively driving said gripper shaft and said gripper tube, the rotary axis of said gripper shaft as well as of said gripper tube being disposed radially inwardly from a point on a tangent to the periphery of the sheet turn-over cylinder at the point of clamping contact of the grippers, and including respective gripper housings rotatably mounted on said gripper tube, said clamping grippers comprising respec-

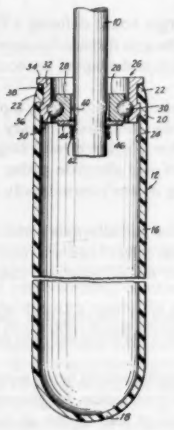


tive first gripper members firmly secured to said gripper shaft, and respective second gripper members firmly secured to the respective gripper housing, a stop member firmly mounted on said gripper tube for each of said second gripper members, said first and second gripper members, in the single-side printing positions of the sheet turn-over device, being located at the outside and the inside respectively, of the periphery of the sheet turn-over cylinder, adjustable limit means spaced from said stop member, said gripper housing respectively being rotatable in direction toward said stop against the biasing action of a compressive spring for closing said clamping grippers and being rotatable in direction toward said adjustable limit means for opening said clamping grippers.

4,101,123
JUMP ROPE

Timothy M. Anthony, 143-40 Roosevelt Ave., New York, N.Y. 11354

Filed Mar. 14, 1977, Ser. No. 776,838
Int. Cl.[2] A63B *5/20*
U.S. Cl. 272—75 **1 Claim**

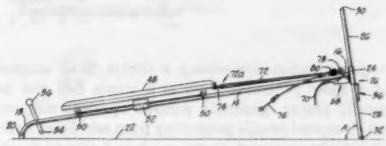


1. A jump rope construction comprising a one-piece hollow handle having an open end defining a handle connecting flange extending into the handle, a ball bearing assembly including balls, a race and a ball bearing housing including an outer flange and an inner shoulder defining therebetween a handle recess, said handle recess being constructed to mate with said handle connecting flange and said ball bearing assembly defining a ball bearing opening at its center for attachment of a rope therethrough, said handle being formed of a flexible resilient material to enable convenient detachment of said ball bearing assembly from said handle by compressing said handle at points proximate its open end thereby forming an oval configuration for said open end along one axis of which said handle recess is removed from said connecting flange.

4,101,124
PULL TYPE EXERCISING APPARATUS

Parker E. Mahnke, 3055 Hollywell Pl., Glendale, Calif. 91206

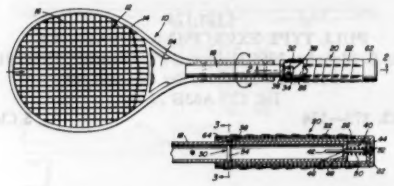
Filed Jan. 18, 1977, Ser. No. 760,388
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—134 **5 Claims**



1. An improved exercising apparatus comprising:
a. a pair of spaced, substantially parallel, generally cylindrically-shaped track members each having a first and second end, said second ends being supportable on a supporting surface;
b. a substantially cylindrically-shaped guide sleeve affixed to each of said track members proximate the first ends thereof, said guide sleeves extending substantially perpendicular to said track members;
c. a generally U-shaped tubular track elevating member having substantially parallel legs interconnected by an upper bight portion, said legs being telescopically receivable within said guide sleeves and having a plurality of longitudinally spaced apart apertures formed therein;
d. a pivotally movable, generally U-shaped member formed of a yieldably resilient material having spaced, substantially parallel sides interconnected by bight portion, said sides having generally L-shaped free end portions spaced apart a distance substantially equal to the distance between said legs of said track elevating member, said end portions being partially receivable within the apertures formed in said legs of said track elevating members and pivotally movable relative thereto from a first interengaging position into a second locking position said end portions being adapted to supportably engage said guide sleeves when said end portions are pivoted into said second locking position;
e. carriage means movably mounted on said track members for supporting a user of the apparatus, said carriage means being reciprocally movable along the length of said track members; and
f. foot engaging means pivotally connected to said track members proximate the first ends thereof for engaging the feet of the user when the user is lying flat on said carriage means, said foot engaging means including handle means for grasping by the user to slidably move said guide sleeves relative to said track elevating member whereby said first ends of said track members can be positioned at selected distances above the supporting surface;
g. operating means for causing reciprocal movement of said carriage means along said tracks comprising:
1. a length of cord affixable to said carriage means;
2. a pair of handles affixed to a corresponding one end of the length of cord for grasping by the user; and

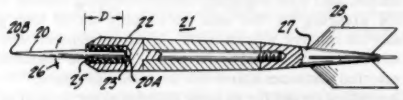
3. cord guide means mounted on said track members proximate the first end thereof, for guiding the length of cord along intermediate portions thereof.

4,101,125
ADJUSTABLE TENNIS RACKET
George Heath, 2449 Fairway Dr., Vero Beach, Fla. 32960
Continuation-in-part of Ser. No. 631,310, Nov. 12, 1975, abandoned. This application Jun. 25, 1976, Ser. No. 699,810
Int. Cl.[2] A63B *49/08*
U.S. Cl. 273—75 **6 Claims**



1. A game racket comprising a racket head adapted for striking a game projectile such as a tennis ball and having substantially planar, generally parallel opposite side striking faces, an elongated handle projecting from said head, hand grip means rotatably mounted on the outer end of said handle for limited angular displacement relative to said head and handle about an axis extending longitudinally of said handle between two predetermined angularly displaced positions, said first position being such as to present said racket head at an appropriate vertical angle relative to said projectile and the ground for forehand striking of said projectile and, without changing the grip on said grip means, said second position being such as to present said racket head at an appropriate vertical angle relative to said projectile and the ground for backhand striking of said projectile, and means interconnecting the handle and hand grip means to positively lock the hand grip means and handle in said adjusted angularly displaced positions, said interconnecting means being releasable during play of a point in response to longitudinal movement of the racket head toward the hand grip means in a manner similar to forces exerted on the head when shifting between a forehand and backhand stroke when using a racket with a rigidly interconnected head, handle and hand grip means to enable angular adjustment of the racket head and handle relative to the hand grip means without moving or releasing any part of the hand in gripping engagement with the hand grip means, and a spring assembly interconnecting the handle and hand grip means to releasably retain the handle and grip means in locked position.

4,101,126
GAME DARTS AND DARTBOARDS EMPLOYING ANTI-BOUNCE-OFF APPARATUS
Ronald A. Kurtz, Englewood, and Henry P. Utzinger, Ridgewood, both of N.J., assignors to Kulite Tungsten Corporation, Ridgefield, N.J.
Filed Nov. 9, 1976, Ser. No. 740,211
Int. Cl.[2] F41J *3/00*
U.S. Cl. 273—95 R **7 Claims**

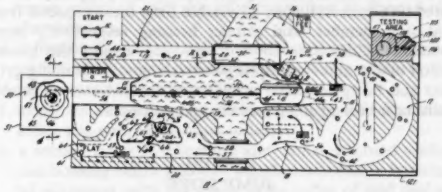


5. A game dart of the type adapted to be thrown at a target of the type including a plurality of grid wires which are relatively impenentrable by a point portion associated with a game dart, the improvement therewith of apparatus for coupling said point portion to said barrel portion, comprising:

a. a cylindrical barrel portion having a point accommodating end and a flight accommodating end, with a coaxial aperture beginning at said point accommodating end and of a given length and diameter,

b. a point portion having a tip end which tapers into a second end of a relatively fixed diameter, said diameter being relatively less than the diameter of said aperture, means coupling said second end to said barrel within said aperture whereby said surface of said point portion as extending within the length of said aperture is separated perpendicular to the axis from said barrel portion by a given distance to thereby permit said tip to pivot or flex according to said separation, said separation selected in accordance with the width of said grid wires to enable said point and therefore said dart to be directed from a wire towards said target when pivoted by said wire, with said separation as provided enabling said point tip to move a distance at least half the width of one of said grid wires.

4,101,127
TARGET AMUSEMENT DEVICE
Glenn W. Isgrig, 7735 Tecumseh Trail, Cincinnati, Ohio 45243
Filed May 23, 1977, Ser. No. 799,383
Int. Cl.[2] A63F *9/14*; F41J *3/02*
U.S. Cl. 273—95 B **13 Claims**



1. Amusement apparatus of the type including a target board having a plurality of targets thereon and a projectile aiming and releasing means for holding a projectile above said target board and for releasing an aimed projectile, said apparatus further comprising:

indicia on said target board defining a first primary path, a portion of said targets disposed proximate portions of said first primary path and adapted to receive released projectiles;

indicia on said target board defining a plurality of alternate paths intersecting said first primary path at respective positions, another portion of said targets disposed proximate portions of said alternate paths;

position indicating means intermittently movable along said paths;

each of said first and said alternate paths ending at a common destination point, each of said alternate paths comprising a further effective distance thereto than said first primary path; and

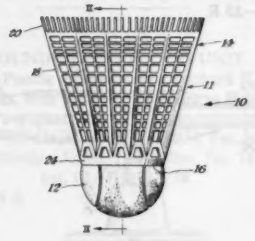
at least two targets of varying size disposed proximate a single intersection between said first path and an alternate path;

said position indicating means being movable along said first path, from said intersection, in response to a projectile hit on a smaller one of said targets at said intersection, and along the alternate path, from said intersection, in response to a projectile hit on a larger one of said targets at said intersection.

4,101,128
PRACTICE TENNIS DEVICE

Robert Yellen, 2201-B NE. 39th St., Lighthouse Point, Fla. 33064

Filed Feb. 22, 1977, Ser. No. 770,382
Int. Cl.[2] A63B 67/18
U.S. Cl. 273—106 A 9 Claims

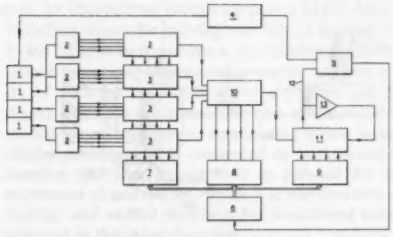


1. A practice tennis device comprising:
a first portion of a regulation spherical tennis ball of at least one-half of the spherical tennis ball, and
a cone means generally equal to the weight of the other portion of the tennis ball severed from said first portion, said cone means connected to said first portion of said spherical tennis ball providing a tennis practice device with a weight generally equal to the weight of a regulation spherical tennis ball providing a player with the same feel when a tennis racquet hits the device as when the tennis racquet hits a regulation tennis ball and said cone means including a winged means for stabilizing said device in flight.

4,101,129
GAMING MACHINES

Calvin Howard Cox, Cotgrave, England, assignor to Bell-Fruit Manufacturing Company Limited, Nottingham, England

Filed Apr. 15, 1976, Ser. No. 677,291
Claims priority, application United Kingdom, Apr. 17, 1975, 15780/75
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—143 R 22 Claims

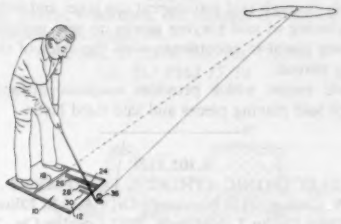


1. Means for detecting prize-winning combinations of symbols in a gaming machine of the kind which selects a combination of symbols at random during each game and awards prizes when predetermined prize-winning combinations occur, said means comprising first memory means for storing information of each of a number of predetermined symbols that can occur in said selected combinations; first comparison means for carrying out succesive first comparison operations in each of which it compares all of the symbols in a selected combination with a respective one of said predetermined symbols stored in said first memory means so as to determine an occurrence pattern for that particular predetermined symbol in said selected combination; second memory means for storing information of each of a number of predetermined symbol occurrence patterns that can occur in said selected combinations; and second comparison means for carrying out successive second comparison operations in each of which it compares one of said occurrence patterns determined by said first comparison means with a respective one of said predetermined occurrence paterns stored in said second memory means that is associated with the predetermined symbol used in the first comparison operation to determine said occurrence pattern and that corresponds to a prize-winning combination, said second comparison means producing a coincidence signal to indicate a win when said determined occurrence pattern corresponds to said predetermined occurrence pattern.

4,101,130
GOLF MAT

Earl Richards, 310 N. Lake Ave., Leesburg, Fla. 32748

Filed Jan. 10, 1977, Ser. No. 757,965
Int. Cl.[2] A63B 69/36
U.S. Cl. 273—187 A 7 Claims

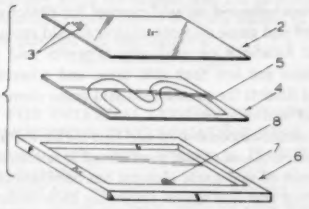


1. A mat for use by a golfer comprising a substantially rectangular sheet of pliable material, a pair of cut-out sections for placement therethrough of the feet of said golfer with the feet resting on the ground, a plurality of parallely disposed separate length and axis indicating straightline markings on said mat substantially perpendicular to the intended line of flight of a golf ball hit by said golfer, each of said markings corresponding to at least one particular golf club type and having an outer end even with the outer end of each other marking, and each of said markings having a length substantially equal to the distance of placement of the golf ball from the outer end of said marking in alignment therewith and outside of the periphery of said rectangular sheet.

4,101,131
COMPETITIVE GAME APPARATUS

Donald W. Barnby, 1111 Army Navy Dr., Apt. C 1004, Arlington, Va. 22202

Filed Aug. 3, 1976, Ser. No. 711,226
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—239 6 Claims



1. Competitive game apparatus comprising:
a plurality of sets of playing pieces, each one of said plurality of set of playing pieces having a plurality of playing pieces which have a common characteristic which distinguishes

them from the plurality of playing pieces of every other set of said plurality of sets of playing pieces;

stacking means included by at least some of said playing pieces whereby said stacking means permits one of said playing pieces to be stacked upon another and said stacking means also tends to prevent lateral movement of such stacked playing pieces relative to one another thereby tending to prevent an upper playing piece from falling off of the playing piece upon which it is stacked;

a multiple layer game board, having a top layer which is essentially a flat sheet made of transparent material, at least one second layer which is essentially a flat sheet located beneath said top layer, and a third layer which is essentially a flat surface located beneath said second layer, said top layer and said at least one second layer being separable;

a first indicia, which designates the playing positions, carried by said transparent top layer;

a second indicia carried on at least one surface of said at least one second layer, said first indicia being different from any part of said second indicia and said second indicia being visible through said transparent top layer and influencing the placing of said playing pieces on said multiple layer playing board in accordance with the rules of the game being played;

magnetic means which provides magnetic attraction between said playing pieces and said third layer.

4,101,132

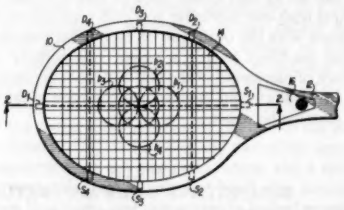
ELECTRONIC ATHLETIC EQUIPMENT

Richard N. Conrey, 3138 Normandy Dr. - Apt. E, Ellicott City, Md. 21043; Phillip T. McQuaid, 7017 Lochlan Cir., Towson, Md. 21239, and Paul J. Yursis, Timonium, Md., assignors to Richard N. Conrey, Ellicott City and Phillip T. McQuaid, Towson, both of, Md.

Filed Dec. 5, 1975, Ser. No. 638,224

Int. Cl.[2] A63B *69/38*

U.S. Cl. 273—29 A **22 Claims**



1. In combination,

a racquet for striking a moveable game element to impart motion thereto, said racquet comprising an area in which contact with said game element is intended to be made;

first means mounted on said racquet for detecting the presence of said game element relative to said racquet at preselected locations on said area wherein said preselected locations are less than said area, and wherein said first means detects the presence of said game element on either side of said racquet;

second means responsive to said first means for providing an indication of one of said preselected locations at which the presence of said game element has been detected, and for resetting said first means following each detection of said game element, whereby repeated detections of said game element may be indicated without requiring intervention by a player using said racquet or by any other person, and said first and second means does not substantially interfere with normal play of said racquet.

4,101,133

PICKUP TONE ARM

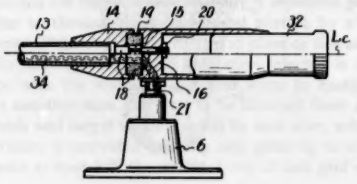
Naohisa Aoki; Hitoshi Matsuda, and Hideaki Hayashi, all of Mitaka, Japan, assignors to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.), Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,666

Claims priority, application Japan, Oct. 16, 1975, 50-141086; Feb. 24, 1976, 51-20708

Int. Cl.[2] G11B *3/18*

U.S. Cl. 274—23 R **10 Claims**



1. A tone pickup arm comprising a main holder portion formed with a central opening, a hollow member with a stylus supported on one end, a hollow member holder into which the second end of said hollow member extends and said hollow member holder formed with a central opening, a damper member of visco-elastic material of generally cylindrical shape and formed with an opening mounted between said main holder portion and said hollow member holder in said central openings, and a suspension wire attached to said hollow member holder and to said main holder portion and said suspension wire mounted so as to pass through said opening in said damper member and so as to be vertically offset above the center line of said hollow member, said hollow member holder and said main holder portion.

4,101,134

SOUND REPRODUCING UNIT TONE ARM

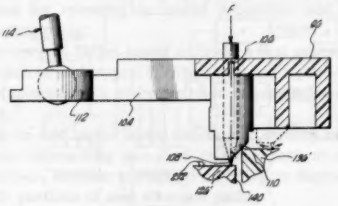
Jay Smith, III, Pacific Palisades, and Richard F. M. Conroy, Woodland Hills, both of Calif., assignors to Hasbro Development Corp., Pawtucket, R.I.

Division of Ser. No. 471,351, May 20, 1974, Pat. No. 4,010,959

Filed Jan. 17, 1977, Ser. No. 760,231

Int. Cl.[2] G11B *3/10*

U.S. Cl. 274—23 R **1 Claim**



1. A sound unit tone arm for picking up and transmitting sound indicia from a recording medium, comprising a tone arm body member mounted adjacent to a recording medium, said tone arm body member including a mounting post positioned on an end thereof for pivotally locating said tone arm body member relative to said recording medium, a hinge member spaced from said mounting post for hingedly connecting said tone arm body member relative to said mounting post, a stylus mounting arm, a stylus located in said stylus mounting arm and engaging said recording medium, hinge means hingedly connecting said stylus mounting arm to said tone arm body member and providing for relative movement between said stylus mounting arm and said tone arm body member, and spring means secured to said mounting post of said tone arm body member for urging said tone arm body member downwardly,

thereby insuring a downward force on said stylus mounting arm to locate said stylus in positive engagement with said recording medium, said recording medium including a first record and a second record located adjacent thereto, said stylus mounting arm having a camming surface formed thereon that is engageable with an adjacent surface for moving said stylus mounting arm and stylus therein from a first record to a second record.

4,101,135

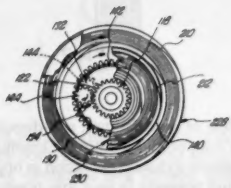
SOUND REPRODUCING UNIT

Jay Smith, III, Pacific Palisades, and Richard F. M. Conroy, Woodland Hills, both of Calif., assignors to Hasbro Development Corp., Pawtucket, R.I.

Division of Ser. No. 471,351, May 20, 1974, Pat. No. 4,010,959. This application Jan. 17, 1977, Ser. No. 760,237

Int. Cl.[2] G11B *3/78*

U.S. Cl. 274—39 A **17 Claims**



9. A sound unit for producing a plurality of combined sound sequences comprising:

a first record member having a plurality of separate sound sequences on a respective plurality of individual sound tracks;

a second record member having a plurality of separate sound sequences on a respective plurality of individual sound tracks, the second record member mounted relative to the first record member to permit relative movement for varying the relative position of the respective sound tracks;

sound pickup means for contacting the first and second member to transmit a combination of the sound sequences;

drive means for driving the first and second record members relative to the pickup means when energized; and

means for transmitting energizing power to the drive means including means for moving one record member relative to the other record member at least during a portion of the power transmission to the drive means, wherein a plurality of different combined sound sequences can be produced when the drive means rotates the first and second record means, said power transmitting means including a carrier member that is connected to said second record member and that is operative to provide for relative movement of said record members in one direction and for locking said record members for concurrent movement together in the other direction.

4,101,136

EXERCISING APPARATUS

James A. Corll, #1 Westlake Dr. N.E., Albuquerque, N. Mex. 87112

Filed Jan. 17, 1977, Ser. No. 759,755

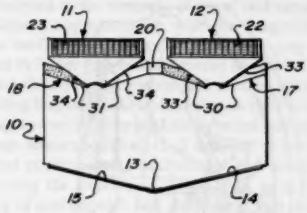
Int. Cl.[2] A63B *69/18*

U.S. Cl. 272—97 **16 Claims**

8. A device, comprising:

two foot pedals of generally triangular cross-sectional shape, an apex of said shape being oriented downwardly,

a block moveable between semi-stable side-to-side positions, having two parallel V-shaped grooves along a top surface to receive said foot plates, the angle between the walls of said V-shaped grooves being larger than the angle between the walls of said downwardly oriented apex of said



foot pedals, whereby the foot pedals are rotatable from side-to-side about said apex within said grooves.

4,101,137

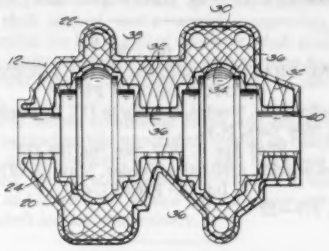
PRESSURE SEAL AND METHOD FOR PRODUCING SAME

Robert R. Travis, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 27, 1976, Ser. No. 726,996

Int. Cl.[2] F16J *15/14*

U.S. Cl. 277—1 **5 Claims**



1. A method for forming a pressure seal between two metallic structural members comprising the steps of forming flat surfaces on each of the two members, texturing at least one of the flat surfaces by providing a plurality of interconnecting grooves thereon in the general region where the pressure seal is desired, the grooves interconnecting in a manner to provide at least one continuous grooved recess through the region where the pressure seal is desired, applying an extrudable sealant on one of the flat surfaces in the general region where the seal is desired, the amount of the sealant being sufficient to fill at least the continuous grooved recess, moving the structural members together with the flat surfaces in facing relation, and clamping the structural members together in a manner to apply sufficient compression between the flat surfaces to establish face-to-face contact between the flat surfaces and to extrude substantially all of the sealant into the grooves, so as to fill the continuous grooves recess with the sealant to provide a pressure seal between the flat surfaces.

4,101,138

GASKET FOR INTERNAL COMBUSTION ENGINES, INCORPORATING LOCATING PINS

Nicola Gaggiano, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Nov. 21, 1977, Ser. No. 853,793

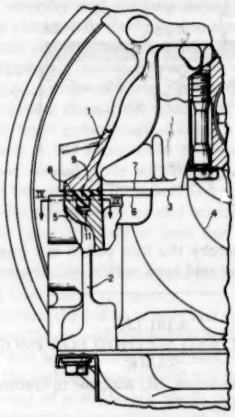
Claims priority, application Italy, Nov. 25, 1976, 53664/74[U]

Int. Cl.[2] F16J *15/02*

U.S. Cl. 277—11 **3 Claims**

1. In an internal combustion compression-ignition engine having upper and lower engine blocks, a vibration-damping gasket of elastic material for interposition between said engine

blocks, wherein the gasket is formed In a single piece with a shape corresponding to that of the mating profile of the lower



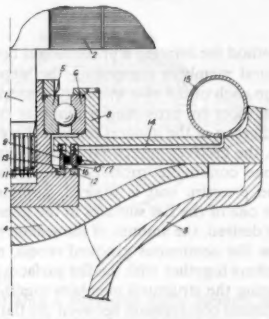
engine block, and wherein the gasket embodies locating pins, made of the same material as the gasket, for engagement in corresponding holes in the lower engine block.

4,101,139

BEARING BRACKET ASSEMBLY FOR A SUBMERSIBLE MOTOR DRIVEN PUMP

Dag Nordin, Taby, Sweden, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,223
Claims priority, application Sweden, May 10, 1976, 7605256
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—22 **8 Claims**



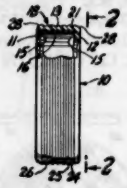
1. A bearing and seal assembly, comprising:
a non-rotating bearing bracket;
a ball bearing having an outer non-rotating ring mounted in the bearing bracket;
a shaft;
a socket fixedly attached to the shaft, said socket and shaft being rotatably supported by the inner rotating ring of the ball bearing;
a pair of radially spaced concentric seal means on said socket;
a pair of radially spaced concentric seal means on said bearing bracket for sealingly engaging the pair of spaced concentric seal means on said socket;
a reservoir; and
conduit means connecting said reservoir to the space between said seal means whereby lubricating and cooling medium may be provided from the reservoir to the space for lubricating and cooling the seals.

4,101,140

PERIPHERALLY GROOVED SEAL

William P. Reid, Long Beach, Calif., assignor to Tetrafluor, Inc., El Segundo, Calif.

Continuation of Ser. No. 237,443, Mar. 23, 1972, abandoned, which is a continuation of Ser. No. 13,630, Feb. 24, 1970, abandoned. This application Nov. 12, 1974, Ser. No. 523,164
Int. Cl.[2] F16J *9/06*
U.S. Cl. 277—165 **10 Claims**

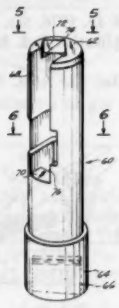


1. As an article of manufacture, a bi-directional sealing ring for use with a cooperative elastomer loading ring for special utility in continuous dynamic operation in opposing fluctuating or pulsating fluid pressure from a low pressure to a relatively high pressure, for example, in a pump or a hydraulic cylinder,
said sealing ring being made of plastic material having the general characteristics of a fluorinated hydrocarbon and having inner and outer circumferentially extending sealing surfaces,
one of said circumferentially extending sealing surfaces being shaped and dimensioned for sealing contact with the cooperative loading ring for transmission of fluid pressure to the sealing ring through the loading ring,
the other of said circumferentially extending sealing surfaces serving to create a dynamic leakproof fluid seal against an adjacent confronting surface when relative axial movement occurs between the sealing ring and the confronting surface in response to said pressure changes applied thereto tending to establish a temporary fluid path between the confronting surface and said other sealing surface,
said other of the circumferentially extending sealing surfaces having a multiplicity of circumferentially extending very narrow and very shallow grooves with oppositely sloping outwardly divergent side walls forming circumferentially extending lands with sloping side walls, the degree of divergence of the opposite sloping walls being such that the walls defining the grooves flatten in transverse cross section in response to relatively high pressure pulsations from the loading ring without forming bulges overhanging the grooves whereby the volumes of the grooves contract in response to the high pressure pulsations and subsequently expand with suction effect as the pressure decreases in the time intervals between the high and reduced pressure pulsations with consequent tendency for the sealing ring to maintain effective sealing contact with the confronting surface in the time intervals thereby preventing leakage in the low pressure condition and blow-by when high pressure is again applied, and whereby the pressure pulsations increase the area of the lands that transmit pressure from the loading ring directly to said confronting surface until the lands support the load,
there being a plurality of the lands on each side of a median plane of the sealing ring so that bowing of the ring away from said confronting surface on the high pressure side of the median line in response to high pressure leaves a multiplicity of lands in effective sealing contact with said confronting surface on the other side of the median line.

4,101,141
DRIVE CHUCK

Eugene W. Mattila, and Joseph M. Maher, both of White Pine, Mich., assignors to Copper Range Company, White Pine, Mich.

Filed Mar. 16, 1977, Ser. No. 778,093
Int. Cl.[2] B23B 31/06
U.S. Cl. 279—19 10 Claims

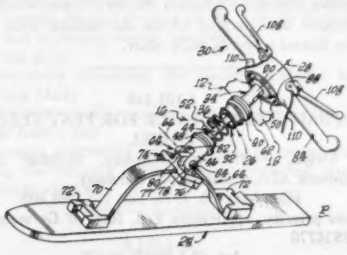


1. A drive chuck for use with a plurality of driven elements comprising a chuck body having an upper surface and a longitudinally extending elongated slot formed therein, said slot opening along the side of the chuck and including a closed base portion located generally parallel to said upper surface, said upper surface having a first recess formed therein in general alignment with said slot, said recess including portions extending beyond the slot to define a base shoulder along the periphery of the recess below said upper surface, and said base portion having a second recess formed therein in general alignment with said slot and having a base shoulder extending across the slot below said base portion whereby said recesses define pockets adapted to receive the end of a tool to be driven through the chuck with the end of the tool received in the pocket supported on the respective base shoulder.

4,101,142
SNOW SLED TURNING MECHANISM

Richard W. Turner, 1786 Tubbs St., Thousand Oaks, Calif. 91360

Filed Mar. 22, 1976, Ser. No. 669,238
Int. Cl.[2] B62B 13/10
U.S. Cl. 280—16 2 Claims

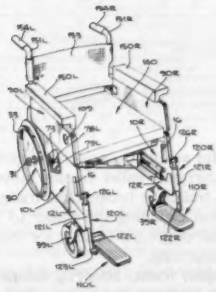


1. A snow sled comprising:
a sled body adapted to support a rider,
a pair of runners along opposite sides of said body adjacent the rear end thereof and having coplanar bottom snow engaging surfaces for slidably supporting said sled body on snow,
a steering ski at the front end of said body having a lower snow engaging surface,
means supporting said ski on said body for turning movement relative to said body comprising a steering shaft extending through the front end of said body with the longitudinal axis of the shaft disposed substantially in a plane normal to the common plane of said runner surfaces and aligned approximately with the longitudinal center line of said body, and with said axis sloping forwardly toward its lower end, bearing means on said body supporting said shaft for rotation on said axis, an arcuate stirrup extending lengthwise of and fixed at its ends to said ski and arching upwardly from said ski between said stirrup ends, a clamp adjustable along and adapted to be secured in adjusted position along said stirrup, and means pivotally connecting the lower end of said shaft to said clamp for turning of said ski with said shaft about said shaft axis and pivotal movement of said ski relative to said shaft about a pivot axis parallel to said ski surface and transverse to both said shaft axis and the longitudinal axis of said ski,
a steering member connected to the upper end of said shaft and operable by the rider for turning said ski,
said steering shaft comprising upper and lower telescoping sections, a cross pin extending through the upper end of said lower shaft section and into longitudinal slots in said upper shaft section so as to connect said shaft sections of rotation of the sections in unison and relative axial movement of the sections, a first compression spring surrounding the upper end of said lower shaft section and seating against said cross pin and a seat in said upper shaft section for urging said lower section upwardly relative to said upper shaft section, and a second compression spring surrounding the lower end of said lower shaft section and seating against shoulders on said shaft sections for urging said lower section downwardly relative to said upper section,
said bearing means comprising radial and thrust bearing means supporting said upper shaft section or rotation and against axial movement relative to said body, and
said ski and steering member being connected to the lower end of said lower shaft section and the upper end of said upper shaft section, respectively.

4,101,143
WHEELCHAIRS

William J. Sieber, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Jan. 3, 1977, Ser. No. 756,419
Int. Cl.[2] B62B 11/00
U.S. Cl. 280—42 56 Claims



1. A wheelchair comprising a pair of frame members, each formed of one piece of material; a pair of wheels; well means indented into the frame members for accommodating a wheel therein and mounting means for mounting a wheel for rotation in each well means; brace means for supporting the frame members in a spaced apart, open position and allowing the frame members to be brought together to a collapsed position comprising a pair of brace members and vertical pivot means

for pivotally mounting the brace members with respect to each other at a central portion of each brace member about a vertical axis; anchoring means on each frame for anchoring one end of the brace members to a frame member for pivoting the brace member with respect to the frame member about a vertical axis; releasable anchoring means for releasably anchoring the second end of the brace members to the frame member opposite the one to which the one end of the brace member is anchored; brake means mounted on the frame members for movement against the wheels for preventing rotation of the wheels; hill holder means connected to the brake means for preventing movement of the wheels in one direction; a handle movable between at least two positions, wherein in the first position, the handle moves the brake means against the wheel to stop the wheelchair and in the second position moves the hill holder means against the wheel to prevent movement of the wheelchair in one direction; an indentation on each frame member adjacent the well means for mounting the handle in the indentation, slot means through the frame member for allowing the brake means to pass through the well means upon movement of the handle to the first position and for allowing the hill holder means to pass through the well means upon movement of the handle to the second position; side members; means for mounting the side members on the top of the frame members in a first position wherein the side members extend vertically from each frame member and in a second position wherein the side members extend horizontally from the frame members; footrest means; means for mounting the footrest means on the frame members including a housing, telescoping means extending downward from the housing and having a mounting bracket for mounting the footrest means thereon, a grip on the top part of the housing, the grip being connected to the telescoping means and being positioned within reach of the user whereby pulling the grip raises the footrest means; a seat between the frame member for supporting a user between the frame members comprising a platform mounted below the top of the frame members, a pit in the platform and a cushion on the platform extending into the pit and being generally flush with the top of the frame members.

4,101,144

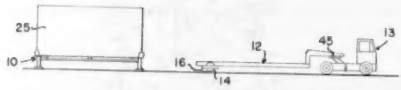
TRAILER FOR HANDLING CONTAINER-CARRYING PALLET FRAMES

Douglas Ross, 3043 122nd Pl. NE., Bellevue, Wash. 98005, and Keith Blackburn, 1316 Florence St., Enumclaw, Wash. 98022

Division of Ser. No. 765,341, Jan. 21, 1977, Pat. No. 4,053,072. This application Oct. 11, 1977, Ser. No. 827,616

Int. Cl.² B62D *21/02*

U.S. Cl. 280—423 B **13 Claims**



1. A trailer for use in a container transport system of the type having load carrying pallet frames mounted on legs to be loaded on the trailer by backing the trailer beneath a selected pallet frame and elevating the trailer to lift the pallet frame with its load out of ground contact for transport on the trailer, said trailer comprising,

a pallet support frame, coupling means on the front of the pallet support frame for connecting it to a towing vehicle,

primary wheel means and caster wheel means mounted on said pallet support frame near the rear thereof, and

level changing means connected to said pallet support frame for selectively raising and lowering the primary wheel means relative to the caster wheel means and pallet support frame to responsively move the rear of the pallet support frame between a lowered position for passage beneath a pallet frame whereat only the caster wheel means supports the rear of the pallet support frame, and a raised position for lifting the pallet frame whereat only the primary wheel means supports the rear of the pallet support frame.

4,101,145

SKI BRAKE

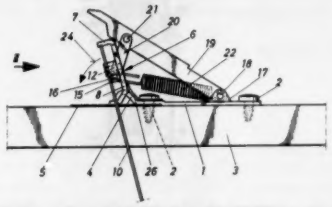
Heinz Korger, Munich, Fed. Rep. of Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jul. 15, 1976, Ser. No. 705,578

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1975, 2533470

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **9 Claims**



1. A ski brake having a lever assembly (**6, 10, 11**) adapted to be mounted on a top surface of a ski with a pivotal axis disposed in close proximity to the top surface of the ski at least approximately transversely to the length of the ski, said lever assembly including first arm means pivotally connected to said ski about said pivotal axis for carrying (**6**) second arm means (**10, 11**), said second arm means comprising two brake wings extending generally longitudinally and having end portions disposed beyond the sides of the ski when the brake is in a braking condition, a pedal adapted for pivotal connection to the ski and (**19**) operable by a ski boot for actuating and moving the ski brake from the braking condition to an inoperative condition, and spring bias means for moving the brake wings laterally with respect to the ski so that the ski brake automatically assumes its braking condition upon removal of a boot from the pedal, the ski brake being characterised in that pivot connection means pivotally connect each brake wing (**10, 11**) to the said first arm means (**6**), the pivot connection means including two pivot pins (**12**) positioned at right-angles to the said first arm means, and that connection means connect the pedal directly to the brake wings so that, when said first arm means is parallel to the ski surface, movement of the pedal (**19**) swings the wings relatively to said first arm means to the inoperative condition wherein the two brake wings are disposed above and parallel to the ski surface with their end portions forced towards each other.

4,101,146

GAS BAG SAFETY DEVICE FOR FLAT STEERING WHEEL

Klaus Oehm, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed May 20, 1976, Ser. No. 688,403

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524770

Int. Cl.² B60R *21/08*

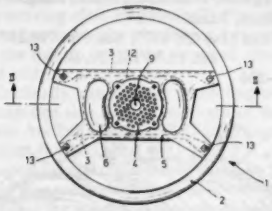
U.S. Cl. 280—731 **2 Claims**

1. A safety device for mounting on a vehicle steering wheel, having a rim connected to a steering column by spokes, comprising:

a gas generator disposed over said column;

a gas bag container, mounted to said spokes and including compartments extending between said spokes and behind said steering wheel in the direction of said column for holding a folded gas bag; and

a gas bag, arranged in a folded configuration in said compartments and across said gas generator, said gas bag



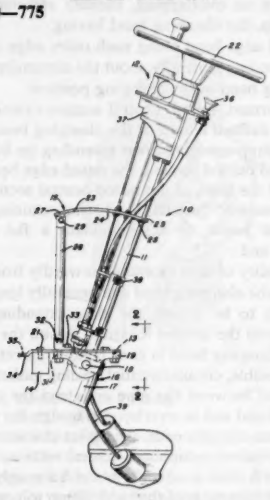
being inflatable in response to gas supplied by said gas generator.

4,101,147

STEERING COLUMN ADJUSTMENT MEANS

Richard M. Ederati, Oswego, and William J. Brown, Naperville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,595
Int. Cl.[2] B62D *1/18*
U.S. Cl. 280—775 **11 Claims**



1. In a steering column assembly for use in steering a vehicle having a frame, improved means for temporarily mounting the steering column to the vehicle frame during assembly of the vehicle to permit steered driving of the vehicle during such assembly, said mounting means comprising:

a mounting plate;

means pivotally mounting the steering column to said mounting plate;

means for temporarily securing the mounting plate to the vehicle frame; and

bracket means removably secured to said mounting plate for holding the steering column in a preselected upwardly extending position.

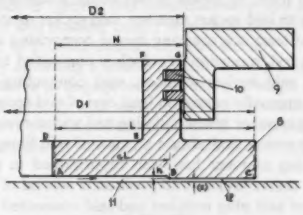
4,101,148

PIPE JOINTS

Alan Stuart Lee, Leicester, England, assignor to The English Electric Company Limited, London, England

Filed Oct. 29, 1976, Ser. No. 736,819
Claims priority, application United Kingdom, Dec. 2, 1975, 49486/75
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—13 **12 Claims**

1. A joint between adjacent ends of a first and a second pipe for conveying liquid under pressure, comprising means to prevent separation of said adjacent ends of said first and second pipes, a first sealing member of annular form in sealing contact with the said end of the first pipe and having a radially extending first sealing surface facing a sealing assembly which incorporates a tubular support section secured to the second pipe at or near its said end, and a second sealing member having a substantially cylindrical surface in sliding and sealing abutment with a co-operating, substantially cylindrical surface of the tubular support section, thereby to permit axial movement of the second sealing member relative to the support section, said second sealing member having an annular, radially extending,



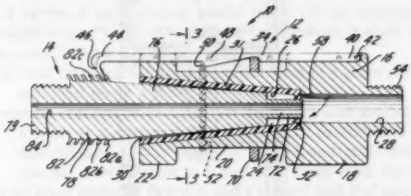
second sealing surface facing said first sealing surface and being urgeable away therefrom by the pressure of the liquid within the pipes against a restraining force, provided at least partly by the pressure of the liquid acting upon at least one further surface of said second sealing member, to provide a clearance between said sealing surfaces which is adequate to permit relative transverse movement of the sealing surfaces to take place without sliding contact but at the same time provides high resistance to the radial flow of liquid between them, thus forming a substantially sealing joint between said adjacent pipe ends.

4,101,149

COUPLING DEVICE

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Continuation-in-part of Ser. No. 479,667, Jun. 17, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,581
Int. Cl.[2] F16L *21/00*
U.S. Cl. 285—55 **14 Claims**



1. A hand adjustable substantially fluid-tight coupling device comprising, in combination, a socket member and a plug member adapted to be removably disposed in said socket member in a first position to form a substantially fluid-tight seal between said members, said plug member comprising a conical-like member including tapered outer walls, and inner walls, said inner walls defining a bore running through said plug member, and at least two securing means, one of said securing means being disposed closer to a narrow end of said tapered outer walls than the other of said securing means, said socket member comprising a body portion including solid rigid outer walls and tapered inner walls defining a tapered passageway running through said body portion, at least one wear resistant lining disposed between said tapered outer walls of said plug member

and said tapered passageway of said socket member, said tapered outer walls of said plug member being adapted to seat in in initial portion of said tapered passageway of said socket member, to define said first position and restricted to said initial position when so seated in that it cannot be moved deeper into the socket member, said plug member and socket member by means of said lining forming a substantially fluid-tight seal between said members, and only after portions of said lining have worn, said plug member being adapted to be repositioned by hand, without the need for use of a tool, with respect to said initial portion of said passageway of said socket member to a second portion of said passageway to define a second position and thereby form, by means of said lining, a substantially fluid-tight seal with said socket member, said socket member further including at least one securing means comprising at least one connecting rod, a portion of which is connected to said body portion of said socket member, said connecting rod being adapted to manually engage at least one of said securing means of said plug member when said plug and socket members are in their first position, and after a portion of said lining has worn and said plug member has been repositioned in said socket member to define said second position, a second of said securing means of said plug member and said connected rod of said socket member are adapted to be manually engaged in a second position relative to each other to retain said plug member in said socket member in substantially fluid-tight engagement, said at least two securing means of said plug member being axially spaced from the wide end of said tapered passageway of said socket member when said plug member and said socket member are in the assembled position.

4,101,150

EXPANSION JOINTS

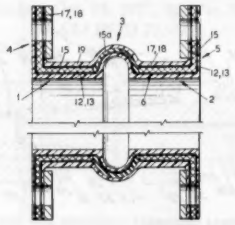
Clive Stafford Thawley, and Thomas Shepherd, both of Dumfries, Scotland, assignors to Uniroyal Limited, Newbridge, England

Filed Sep. 9, 1976, Ser. No. 721,925

Claims priority, application United Kingdom, Oct. 13, 1975, 41813/75

Int. Cl.[2] F16L *27/10, 51/02*

U.S. Cl. 285—226 **15 Claims**



1. An expansion joint or dredging sleeve comprising two annular end sections joined by an intermediate outwardly arched section, each end section terminating in a flange, the sleeve having a body built up from rubber and fabric ply construction throughout its length, a reinforcement in each end section comprising a ring of rubber having a Shore A hardness of not less than 70° sandwhiched between two rings of a fabric comprising cords which have a compression deflection characteristic not exceeding 1% under a load of 40 kg, said cords extending substantially circumferentially of the rings and the reinforcement extends into each flange, a reinforcement in the intermediate section including a ring of rubber of a hardness not more than 60° Shore A, said ring being of substantially the same thickness as the ring in the end section reinforcement.

4,101,151

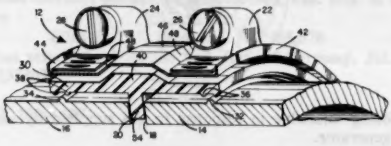
CLAMP ASSEMBLY

Harry J. S. Ferguson, Winchester, Mass., assignor to Clamp-All Corp., Needham, Mass.

Filed May 19, 1977, Ser. No. 798,397

Int. Cl.[2] F16L *21/06*

U.S. Cl. 285—236 **8 Claims**



1. A clamping assembly such as for joining two pipes in an end-to-end relationship in a clamping position, which assembly comprises:

(a) a flexible, sheet-metal, clamping band of defined length and adapted to surrounding circumferentially the ends of the pipes to be joined with the opposite ends of the clamping band in an overlapping, slidably adjustable, nesting relationship, the clamping band having

(i) a raised edge bead along each outer edge of the band and extending generally about the circumference of the clamping band in the clamping position;

(ii) a preformed, raised, central section extending generally the defined length of the clamping band;

(iii) band-strap-retaining areas extending on both sides of the raised central section, the raised edge beads on each side and the sides of the raised central section forming two generally parallel band-strap-retaining areas of sufficient width to accommodate a flat band-strap therein, and

(iv) a plurality of slots extending inwardly from the outer edge of the clamping band and generally longitudinal to the ends to be joined, the slots extending generally throughout the defined length to permit the adjustment of the clamping band in each band-strap-retaining area;

(b) a compressible, circumferential, sealing gasket adapted to be disposed between the pipe ends and the overlapping clamping band and to overlap and bridge the entire junction between the pipe ends, the gasket characterized by an outwardly raised, peripheral, central section, which central section is contoured in form and fits snugly within the raised central section of the band clamp to prevent movement of the sealing gasket in the clamping position; and

(c) at least a pair of flat band straps, one strap disposed and positioned in each of the band-retaining areas of the band clamp, the band straps including a band-tensioning means, whereby the band straps may be tightened to compress the underlying sealing gasket into a fluid-tight sealing relationship.

4,101,152

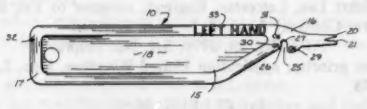
FISHERMAN'S KNOT TYING JIG

Walter E. Gardipee, P.O. Box 2925, Missoula, Mont. 59801

Filed Dec. 23, 1976, Ser. No. 753,887

Int. Cl.[2] D03J *3/00*

U.S. Cl. 289—17 **9 Claims**



1. A hand held jig for tying fisherman's knots, comprising:

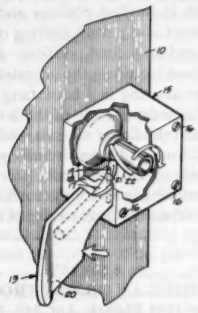
an elongated body having a forward end and a rearward end with side surfaces extending therebetween;
said forward end being tapered to a tip;
an open receiving cleft longitudinally formed in the tip to receive a first line bight of a fishing line and enable a free end of the fishing line to be wrapped about the tapered forward end;
two longitudinally spaced pegs projecting outward of the body from one side surface rearward of the cleft for enabling the free end of the fishing line to form a second line bight about the two pegs; and
an open notch formed transversely in the body between the two pegs for enabling the free end of the fishing line to be inserted into the notch and through the second line bight between the two pegs.

4,101,153

QUICK OPENING LOCK ASSEMBLY FOR DOORS AND METHOD

Donald P. Dozier, 2301 Crystal Ave., Concord, Calif. 94520

Continuation of Ser. No. 517,477, Oct. 24, 1974, abandoned.
This application Jul. 29, 1977, Ser. No. 820,021
Int. Cl.[2] E05C *15/02, 1/14*
U.S. Cl. 292—92 **13 Claims**



1. A lock assembly comprising
a rotary tubular spindle,
a latch unit including a latch movably mounted therein for movement between locked and unlocked positions,
an adapter, adapted to replace a door knob, including a tubular sleeve slidably mounted on said spindle and cam means disposed in spiralled relationship on said sleeve,
means detachably mounting said sleeve on said spindle for preventing both rotational and axial displacement of said sleeve relative to said spindle,
motion transmitting means mechanically interconnected between said latch and said spindle for moving said latch to its unlocked position upon rotation of said adapter,
handle means movably mounted adjacent to said adapter and operatively engaged directly with said cam means for rotating said adapter and said spindle upon movement of said handle means, and
a housing enclosing said adapter and said spindle and wherein said handle means comprises a single stem extending through a sidewall of said housing and pivotally mounted thereon, an inner end of said stem engaging said cam means in substantial line and sliding bearing contact therewith, said means detachably mounting said sleeve on said spindle being independent of said housing and maintaining said sleeve in a fixed axial position relative to said spindle so that the inner end of said stem will be continuously and precisely maintained in bearing contact with said cam means upon pivoting of said handle means on said housing to move said latch between its locked and unlocked positions.

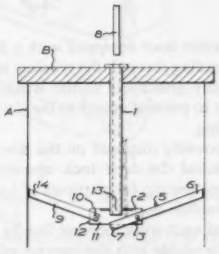
11. A method for converting a lock assembly to panic hardware, said lock assembly mounted on a door and comprising a latch unit movable between normally locked and unlocked positions relative to a door frame having said door hingedly mounted thereon, a rotary spindle, a knob detachably mounted on said spindle and motion transmitting means mechanically and interconnected between said latch unit and said spindle for moving said latch unit to its unlocked position upon rotation of said adapter, said method comprising the steps of
detaching said knob from said spindle,
attaching a tubular adapter sleeve, having a spiralled cam secured thereto, directly to said spindle to prevent both rotational and axial movement therebetween,
securing a housing to said door to enclose said spindle, and said sleeve therein and simultaneously spacing an outer wall of said housing axially relative to an outer end of said sleeve to prevent contact therebetween;
pivotally mounting a handle on said housing and adjacent to said sleeve to engage an inner end of a single stem of said handle directly with said cam in bearing contact therewith whereby pivoting of said handle will rotate said sleeve and said spindle to move said latch unit to its unlocked position.

4,101,154

LOCKING DEVICE FOR WELL COVERS AND THE LIKE

Rune Kägström, 36a, Tunbyvägen, Vesteras, Sweden (S-722 23)

Filed Oct. 19, 1976, Ser. No. 733,939
Claims priority, application Sweden, Oct. 21, 1975, 7511782
Int. Cl.[2] E05C *3/06*
U.S. Cl. 292—237 **17 Claims**



1. A locking device for use in locking a removable lid such as a cover, a well grating or the like over an opening of a straight-walled hole such as a well, a manhole, a shaft or the like, said locking device comprising:
at least one locking member in the form of a lever pivotally mounted about a journal;
means, separate from a lid, for mounting said journal with respect to the lid such that said journal extends in a direction parallel to the plane of the lid and such that said journal is immovable in a direction away from the lid;
said lever having a first end and a second end, and said lever being automatically pivotable about said journal such that said first end automatically engages with a first straight wall surface of a hole to be covered by the lid;
at least one abutment means, mounted on said mounting means, for abutting against a second straight wall surface of the hole when said first end of said lever abuts against said first straight wall surface and for preventing lateral shifting of said first end of said lever out of engagement with said first straight wall surface, thereby locking the lid in the hole covering position thereof;
the sum of the distance between said first end of said lever and said journal and the distance between said journal and said abutment means being greater than the straight line distance between said first end and said abutment means;
said first end of said lever when engaging said first straight wall surface being closer to the lid than is said journal; and

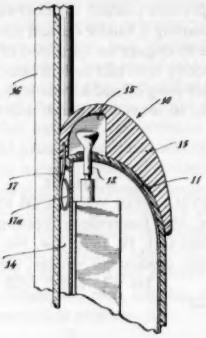
operating means, operable from the outside of the lid and extendable through at least a portion of said mounting means, for engaging said second end of said lever and for pivoting said lever about said journal such that said first end of said lever is disengaged from said first straight wall surface, thereby unlocking the lid from the hole.

4,101,155

DEVICE FOR PREVENTING UNINTENDED UNLOCKING OF AUTOMOBILE CAR DOORS

Nathan Cohen, 89 Bradly St., North Haven, Conn. 06473

Filed Mar. 18, 1977, Ser. No. 779,144
Int. Cl.[2] E05C *19/00*
U.S. Cl. 292—347 **4 Claims**



1. In an automobile door equipped with a door lock operating member protruding through the window ledge of the door, a device removably attachable to the window ledge on the inside of the door to prevent access to the door lock operating member comprising

(a) a hood removably disposed on the door at the window ledge to conceal the door lock operating member and prevent access thereto for purposes of locking or unlocking the automobile door;

(b) an elongated anchoring member fixedly mounted on the hood and extendable into the interior of the door to anchor the hood to the door; and

(c) the anchoring member provided with biasing means to press against an interior wall of the door with sufficient force to substantially retard ordinary removal of the hood from the window ledge.

4,101,156

CLAMPING RING FOR REMOVABLE COVERS OF DRUMS

Cesar Santoni, Hamilton, Canada, assignor to Greif Bros. Corporation, Delaware, Ohio

Filed May 28, 1976, Ser. No. 690,941
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—256.69 **7 Claims**

1. An improved clamp ring for use in releasably holding a cover in assembled relationship with a drum comprising:

a split ring having two ends positioned substantially adjacent to one another;

a locking lever pivotedly connected adjacent one of its ends with one of the ends of the split ring;

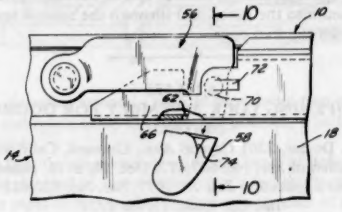
said lever having a slot therein;

linkage means for pivotally connecting the other end of the split ring with an intermediate portion of the locking lever;

the pivotal connections being so constructed and arranged that the locking lever is shiftable from an open position away from the split ring at which the split ring is in an expanded position to a locking position adjacent surfaces of the split ring at which the split ring is in a contracted position;

a latch pivotally mounted on said split ring being in the form of a base terminating in a finger whereby the latch is adapted to be pivoted downwardly until the finger extends through the slot in the lever and adapted to be shifted from an unlatched position away from the split ring to a latched position in interengagement with the lever when the lever is in its locked position;

removable sealing means including an arcuately shaped finger portion on the latch adapted to automatically engage with surfaces on the lever when the latch is shifted to seal the latch in latched position and positioned so that removal thereof will permit shifting of the latch between the latched and unlatched positions; and



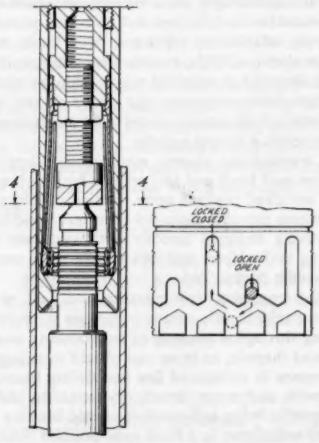
said sealing means including the arcuately shaped portion of the finger terminating in a hook tang position to interengage with the under surface of the lever adjacent the slot through which the finger extends, and further including a second lock formed by an arcuate portion of the latch finger terminating in an inwardly laterally projecting tang adapted to interengage with the surfaces adjacent the slot of the lever when the finger extends therethrough.

4,101,157

TOOL FOR FISHING AN OBJECT FROM A BORE HOLE

Vernon T. Richey, 1111 Blalock, Apt. 160, Houston, Tex. 77055

Filed Jul. 11, 1977, Ser. No. 814,197
Int. Cl.[2] E21B *31/02*
U.S. Cl. 294—86.21 **3 Claims**



1. A tool for fishing an object out of a bore hole, comprising:

(a) a tubular body having

(i) an upper end for connecting to apparatus extending from the surface to raise and lower the tool in and out of the bore hole,

(ii) a lower end for extending around and over a portion of the object, said lower end having a tapered surface located thereon;

(b) fingers mounted within said body for coacting with the tapered surface of said body to move between an opened position and a closed position;

(c) a spring mounted within said body for urging said fingers toward the lower end of said body for coaction with the tapered surface;

(d) camming means mounted within said body for controlling the movement of said fingers between the opened and closed positions having

(i) a sleeve rotatably mounted within said tubular body forming a cam face defining "J" slotted grooves with upwardly extending stems located at the closed and opened positions of said fingers and connecting grooves between "J" slotted grooves thereby forming a single cam groove which permits recycling of said fingers between the opened and closed position,

(ii) a pin extending from said tubular body into and coacting with the cam groove to cause the sleeve to rotate between the opened and closed positions by moving said body toward and away from the object after engagement with a portion of the object, the fingers moving into the closed position by the urging of the spring and by the movement of the pin upward into the closed position stem of the "J" slotted grooves and the fingers moving into the opened position by overcoming the urging of the spring and by movement of the pin upward into the opened position stem of the "J" slotted grooves; and

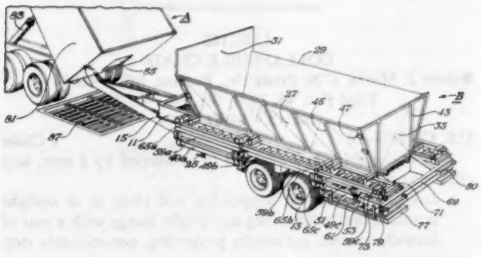
(e) lugs mounted with said sleeve for nesting within corresponding slots formed in said body which defines first shoulders between the slots and second shoulders at the bottom of the slots, said lugs having downwardly facing shoulders for abutting against the first shoulders to limit movement of the pin in the opened position stem of the "J" slotted grooves and for abutting against the second shoulders to limit movement of the pin in the closed position stem, the opening and closing of the fingers and movement of the lugs being provided by movement of said body toward and away from the object after engagement with a portion of the object, which causes the first and second shoulders to move downwardly relative to the lugs and the pin to move downwardly within and coact with the cam groove for rotating the sleeve and lugs into alignment such that the downward facing shoulders of the lugs will abuttingly engage with the respective first or second shoulders of said body.

4,101,158

CONVERTIBLE TRAILER FOR HAULING GRAIN AND A HARVESTING MACHINE

James Thomas Jones, Rte. 5, Box 114, Waco, Tex. 76705

Filed Sep. 13, 1976, Ser. No. 722,516
Int. Cl.[2] B60P 3/42
U.S. Cl. 296—10 **13 Claims**



10. A dual purpose trailer for selectively hauling grain in bulk and for hauling a combine, comprising:

a rectangular frame mounted on wheels and having a tongue and hitch means for being towed by a truck;

front, side, and rear panels, carried by the trailer, and means for selectively interconnecting them in a position defining a hopper for hauling granular material in bulk, and in a storage position for storing the panels to create a substantially flat bed;

dumping means carried along the bottom of the frame for releasing grain carried within the hopper; and

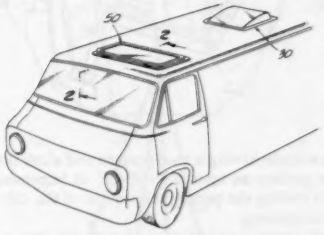
an extensible track hingedly carried by the frame along its sides so as to be foldable from a storage position wherein the trailer width is substantially equal to the distance between the outer edges of the wheels to an extended position located laterally of the outer edges of the wheels, thereby increasing the width for receiving a combine with an overall wheel width greater than the overall wheel width of the trailer.

4,101,159

VAN OVERHEAD CONSOLE

Buster D. Stewart, 16123 Runnymede St., Van Nuys, Calif. 91406

Filed Jul. 12, 1977, Ser. No. 814,863
Int. Cl.[2] B60R 7/04
U.S. Cl. 296—37.7 **7 Claims**



1. For installation in the interior of a standard American manufactured van,

an elongate molded overhead and rear corners console assembly selectively moldable in three different lengths to fit the three standard lengths of said American manufactured van;

said console assembly having front and rear raised overhead portions thereon to receive electronic accessory means;

a recessed cutout area in said front overhead portion to cooperate with and in which is mounted at least one sun roof assembly means;

a recessed cutout area in said rear overhead portion to contain and cooperate with and in which is mounted at least one rear roof vent means;

variable length recessed areas to contain mirror means in said rear overhead portion thereof;

spaced cutout means in said overhead console assembly in which are mounted light means and alarm means;

symmetrical raised means on each side of said front overhead portion of said console assembly for mounting speaker means;

raised portions in the upper portion of each of said rear corners assembly into which are mounted speaker means;

the edges of said recessed cutout areas of said overhead molded console assembly overlap and interact with said sun roof assembly means to rigidly attach said front overhead portion to the roof of said standard American manufactured van;

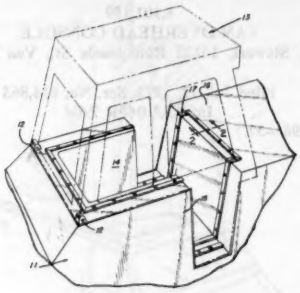
a curtain track on which a curtain is hung separating the cab portion of said van from the rear portion of said van said track being mounted transversely across the width of said overhead console assembly;

attachment and spacer means to which said console assembly is secured at a distance from the roof of said van;
fastener means for engaging said console assembly with said attachment and spacer means;
insulation means between said console assembly and said roof of said van;
fastener means for attaching said rear corners assembly portions to the rear corners of said van: of said van.

4,101,160
SEMI-MODULAR CAB JOINT LINE SEALING ARRANGEMENT

William T. Mounts, Chillicothe, and Joseph B. Stratton, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,521
Int. Cl.[2] B62D *23/00*
U.S. Cl. 296—35 R **14 Claims**



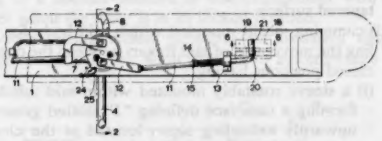
1. In a vehicle having a base portion and a cab defining with said base portion an operator's space, an improved joint line means for sealing the peripheral portion of the cab to the base portion comprising:
channel means secured to said cab defining a projecting channel extending lengthwise along said cab peripheral portion, said channel means defining a web portion spaced from said peripheral portion and having spaced openings therein;
cooperating threaded securing means having a first portion secured to said vehicle base portion and a second portion having a manipulating portion received in said channel permitting threading of said second securing means portion to said first securing means portion to secure said channel means to said vehicle base portion along the length of said channel web at said openings; and
a compressible seal means adjacent said channel means extending lengthwise parallel thereto, said seal means having an uncompressed thickness greater than the projection of said channel means whereby said seal means is sealingly compressed between said cab peripheral portion and said vehicle base portion as an incident of the securing of the cab to said base portion by said threaded securing means.

4,101,161
OPENING ROOF ASSEMBLIES FOR VEHICLES

John Josiah Currall, Birmingham, England, assignor to Weathershields Limited, Birmingham, England

Filed Jun. 2, 1976, Ser. No. 691,984
Claims priority, application United Kingdom, Jun. 6, 1975, 24350/75
Int. Cl.[2] B60J *7/18*
U.S. Cl. 296—137 H **9 Claims**

1. An opening roof assembly for a longitudinal opening in a roof of a vehicle, said assembly comprising a flexible fabric covering, cross-members supporting said covering and including a front cross-member, guides extending along each side of said opening on which said cross-members are adapted to slide, handle-operated means carried on front cross-member for drawing said covering forwardly to tighten it, a substantially rigid transverse flap to which the front end of said covering is attached, a pivotal connection between said transverse flap and said front cross-member, transmission means between said flap and said front cross-member for drawing down said flap into close sealing engagement with said roof around the front end

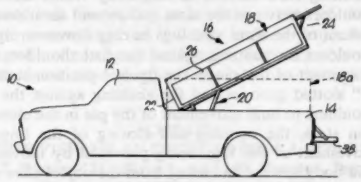


of said opening, said transmission means being actuated by said handle operated means and comprising a pair of rods mounted in said front cross-member, means for moving said rods relatively towards and away from each other in response to rotation of said handle-operated means, and downwardly depending flanges mounted on said flap and provided with inclined slots in which free ends of said rods engage.

4,101,162
VERTICALLY SWINGABLE CAMPER SHELL

Leland Koehn, 211 E. Panta 7E, Halstead, Kans. 67056

Filed Jan. 6, 1977, Ser. No. 757,485
Int. Cl.[2] B60P *3/42*
U.S. Cl. 296—137 B **10 Claims**



1. In combination with a light truck of the type having an open-topped body and a cab at one end of said body extending upwardly beyond said top, a cover for the top including:
a hollow, open-bottomed, box-like shell on said body overlying said top in normally closing relationship to the latter, said shell including an upright end wall adjacent said cab and extending transversely of the truck; and
hinge means mounting said shell on said body for swinging vertical movement of the shell about a fixed transversely extending axis adjacent the uppermost portion of said end wall whereby said shell may be selectively shifted from its closing relationship over said top to permit unobstructed access to the body of the truck.

4,101,163
COLLAPSIBLE CHAIR

Robert J. Morin, 4720 Preda Dr., Pontiac, Mich. 48054

Filed Feb. 16, 1977, Ser. No. 769,239
Int. Cl.[2] A45D *29/04*
U.S. Cl. 297—16 **1 Claim**

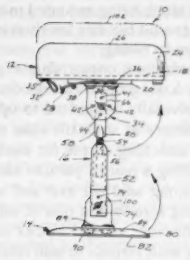
1. A collapsible chair adapted to be carried by a user, said chair comprising:
a disk-shaped base for supporting said chair in an upright position, said base having an upright flange with a pair of laterally spaced, outwardly projecting, non-movable stop pins;
a leg having first and second members telescopically attached for relative rotational movement, said first member

having first and second laterally spaced bores disposed at 90° intervals for selectively and laterally receiving said stop pins to permit said disk-shaped base to be locked in a first position wherein said leg is disposed along an axis perpendicular to said base and a second position wherein said leg is inclined at 90° with respect to said first position;

a first threaded fastener extending through said leg and said base flange;

a nut engaged by said fastener to secure said leg to said base in either of said positions;

said second member having a second pair of laterally spaced and outwardly projecting, non-movable stop pins;



a seat having a downwardly projecting flange with first and second laterally spaced bores disposed at 90° intervals for selectively and laterally receiving said second stop pin to permit said seat to be locked in a first position wherein said seat is disposed in a plane perpendicular to said leg and a second position wherein said seat is inclined at 90° with respect to said seat first position;

a second threaded fastener extending through said leg and said seat flange;

a second nut engaged by said second fastener to secure said leg to said seat in either of said seat positions; and

strap means connected to said seat to facilitate the carrying of said chair when the same is in its collapsed position.

4,101,164

FOLDING SEAT AND TABLE UNIT

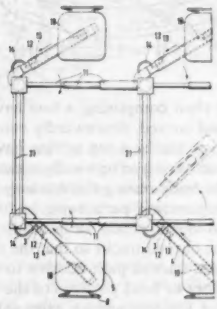
Luis Vega Urdanoz, Urnieta (Guipuzcoa), Spain, assignor to Manufacturas Vega S.A., Urnieta, Spain

Filed Dec. 22, 1976, Ser. No. 753,584

Claims priority, application Spain, Dec. 24, 1975, 443862; May 5, 1976, 447601; Mar. 29, 1976, 446460; Jan. 8, 1976, 217905

Int. Cl.[2] A47B *1/08, 3/14*

U.S. Cl. 297—159 **14 Claims**



1. In a folding seat and table unit of the type having a plurality of seats and a table connected together into an articulated unit, said table being adapted to extending and retracting, the improvement comprising:

(a) a plurality of substantially vertical legs on said table;

(b) at least one seat;

(c) connecting means for connecting said at least one seat to a corresponding one of said legs;

(d) folding and unfolding means on said connecting means for pivoting said seat between an unfolded position and a folded position about the axis of said one of said legs;

(e) pivot means on said means for connecting for rotating said seat from a substantially horizontal position to a substantially vertical position during motion by said folding and unfolding means from said first position to said second position; and

(f) unfolding framework means on said table for moving at least some of said legs closer to some others thereof while maintaining all of said legs substantially vertical and parallel.

4,101,165

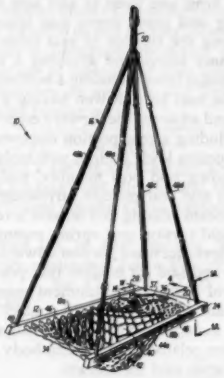
HAMMOCK CHAIR

Henry H. Hammer, Louisa, Va., assignor to Twin Oaks Community, Louisa, Va.

Filed Mar. 2, 1977, Ser. No. 773,736

Int. Cl.[2] A47C *15/00*

U.S. Cl. 297—273 **18 Claims**

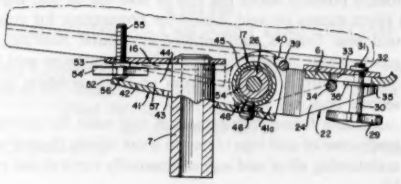


1. In a hammock chair for supporting an occupant above a floor, said hammock chair including a rigid outer seat frame for supporting a seat fabric, a flexible seat fabric extending across the frame for holding said occupant, and a main support means for supporting said frame above said floor, the improvement wherein said rigid outer frame includes two independent side rigid members and an independent rear rigid member, said rear rigid member having mounted thereon an attaching means for mounting said side rigid members at opposite ends of said rear rigid member to form the shape of a quadrangle having one open side, said seat fabric extending between said rear and side rigid members to form a chair seat enclosed by said rear and side rigid members along three edges thereof but not along a fourth forward edge thereof, said side rigid members extending lengthwise along the ends of said rear rigid member and said attaching means including an elongated tension rod extending transversely through both of said side rigid members and longitudinally along said rear rigid member proximate a rear edge of said rear rigid member, such that when an occupant sits in the flexible seat fabric said side rigid members are held in position by tension forces acting on the tension rod and compression forces produced at forwardly positioned corners of the rear rigid member, said forward ends of the side rigid members tending to flex toward one another.

4,101,166
CHAIR CONTROL MECHANISM

Richard A. Rauschenberg, N. Jackson; Melvin A. Textoris, Struthers, and Philip J. Williams, Poland, all of Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Jul. 7, 1977, Ser. No. 813,652
Int. Cl.[2] A47C 3/00
U.S. Cl. 297—304 14 Claims

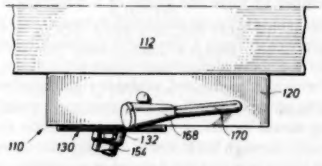


1. A chair control mechanism including, a control body provided with a pair of spaced apart side flanges and having a medially disposed central web therebetween, a post member depending from said web, a tilt torsion unit transversely disposed between said side flanges, an axle pin spanning said side flanges and supporting said torsion unit rearwardly of said web and post member, a tilt bracket having a pair of side arms extending forwardly from a rear portion and affixed to said torsion unit, an inner sleeve freely mounted about said axle pin between said side arms and fixed to said side arms, an outer sleeve surrounding said inner sleeve and spaced therefrom, spring means joining the interior of said outer sleeve to the exterior of said inner sleeve and applying a torsional force therebetween, a tension lever including a bottom web joined to a pair of side walls, said bottom web having a forward edge disposed beneath and adjacent the forward edge of said control body web and including a rear portion disposed beneath said torsion unit, said torsion lever bottom web including an opening freely surrounding said post member, said tension lever side walls adjacent said rear portion surrounding said torsion unit outer sleeve, means affixing said tension lever to said outer sleeve whereby, said torsion unit spring means concurrently urges said tension lever forward portion upwardly toward said control body web and said tilt bracket rear portion upwardly toward said control body and adjustment means forward of said post member and intermediate said control body web and tension lever web manipulable to alter the angular disposition of said tension lever relative said control body and thus vary the torque acting upon said tilt bracket.

4,101,167
TILTING UNIT FOR FURNITURE SUBSTRUCTURES

Stellan Örnberg, Jönköping, Sweden, assignor to Kalmar Läns Landsting, Kalmar, Sweden

Filed May 24, 1976, Ser. No. 689,152
Claims priority, application Sweden, Feb. 6, 1976, 7601316
Int. Cl.[2] A47C 3/026
U.S. Cl. 297—328 8 Claims



1. A tilting unit for furniture such as an easy or office chair including a seat tiltably mounted on a base, the tilting unit comprising:

a retaining structure attached to the seat of the chair;

a carrying structure pivotally supporting the seat retaining structure on a tilt axis and in turn attached to the base of the chair; and

a prestressing means interposed between the retaining and carrying structures for resiliently urging the structures into an initial or rest position, said prestressing means comprising at least one solid block of elastomeric material located between said retaining and carrying structures and being confined on one side of the tilt axis, said block or blocks being exposed to elastic compression to oppose thereby the relative tilting movement of said retaining and carrying structures, means securing each elastomeric block to one and only one of said retaining and carrying structures, said securement being a releasable securement, and each said block being mounted in a position adjustable with respect to said tilt axis for thereby varying the resilient opposition to tilting;

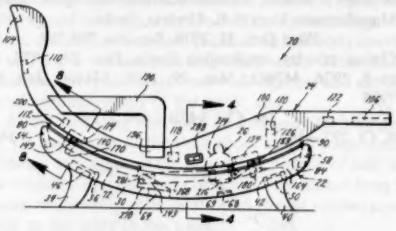
said carrying structure comprising a generally U-shaped stirrup means having opposed legs connected by a bridge portion and pivotally connected to opposing sides of said retaining structure at such tilt axis, said securing means including an attaching screw for each block, said bridge portion including a pair of parallel elongated slots spaced side-by-side along said tilt axis and accommodating the block attaching screws of a pair of said blocks for adjustment of the distance of said blocks to the tilt axis of the stirrup means with respect to said retaining structure, said retaining structure having the form of a box, each said block being held in compression between said stirrup bridge portion and the bottom of said retaining box;

one leg of said stirrup means having a projecting arm having surfaces for locking engagement spaced from said tilt axis, said retaining box mounting a clamping means operable for gripping the locking surfaces of said arm therebetween and thereby locking the tilting unit in a desired tilted position.

4,101,168
ADJUSTABLE CHAIR

Arthur Charles Ferro, St. Louis, Mo., assignor to Contour Chair-Lounge Co., Inc., St. Louis, Mo.

Filed Dec. 15, 1976, Ser. No. 750,917
Int. Cl.[2] A47C 1/024
U.S. Cl. 297—329 2 Claims



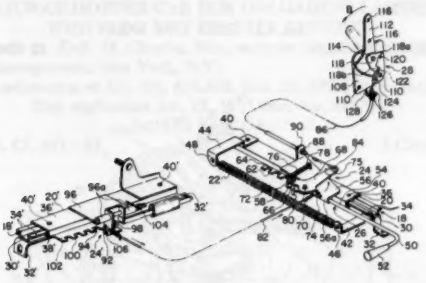
1. A positionable chair comprising: a base having transverse support structure and curved, downwardly convex, longitudinally disposed support tracks; a top section having transverse support structure and having an upwardly concave top surface whereby parts of the body resting thereon may be higher than other points, the top section parts being in fixed relation to each other from end to end; means for movably supporting the top section upon the curved tracks so that the top section as a whole can move in a curved path relative to the base alternately to raise the foot or head portions of the chair; a power assembly comprising a motor and an extensible drive means connected together as a unit, the extensible drive means having a first portion operatively connected to and united with the motor and a second portion associated with the first portion and moved toward and away from the first portion upon oper-

ation of the motor; connecting means to pivotally connect one portion of the power assembly to the base transverse structure at a first point thereon; and other connecting means to pivotally connect the other portion of the power assembly to the top section transverse structure at a second point longitudinally separate from the first point, so that the power assembly can move the top section in the curved path relative to the base and the power assembly can pivot relative to the top section and to the base between the transverse support structure of the base and the top section during the curved movement; and said connecting means for the base and top section confining movement of the extensible means between the pivotal connections of the base and top section; the base section comprising side rails and the base transverse structure comprising transverse braces at intervals along the base side rails holding the side rails together; the top section being likewise formed of side rails and the top section transverse structure comprising transverse braces at intervals along the top section side rails holding those side rails together; the braces of the top section between the two points being above the bottom of the top section, and the braces of the base section being below the top thereof, to provide an open space in the sections between the first and second points; the motor portion of the power assembly being pivotally mounted on the underside of a brace of its section within said space and projecting therefrom toward the other section, and the second portion of the extensible drive means being pivotally connected to the upper side of a brace of the other section in the said space and projecting therefrom toward the first section, so that the power assembly can be extended and contracted, to move the top section in its curved path, without interference with the transverse braces; the connections on the base section being at least substantially wholly below the upper limits of the base section at the connections, and the connections on the top section being below the top thereof and depending below the top section, to dispose the extensible drive means at least largely below the top section.

4,101,169
ADJUSTABLE SEAT FOR A MOTOR VEHICLE

Masakazu Muraishi, Higashi-murayama, and Takao Sekino, Hiratsuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 25, 1977, Ser. No. 771,983
Claims priority, application Japan, Feb. 27, 1976, 51-20794
Int. Cl.[2] B60N *1/04*
U.S. Cl. 297—341 **7 Claims**



1. A seat structure for a motor vehicle, having a stationary base member adapted to be fixed to said vehicle, a movable support member slidable on said stationary base member for carrying a seat cushion, and a tilting means for allowing a seat back to be tilted relative to said seat cushion, said seat structure comprising:

seat position memorizing means for memorizing the seat position which is initially set at will in fore-and-aft direction of said vehicle and including a plurality of detents fixed to said stationary base member, a control lever connected to said movable support member so as to be rotatable about the axis thereof and longitudinally movable relative to said movable support member, and a plate member firmly fixed to one end of said control lever and having an opening therein for engagement with one of said detents when said control lever is rotated about the axis thereof in one direction at a predetermined angle, said plate member being formed with a latch slot at its side portion;

seat locking means for locking said movable support member to said stationary base member;

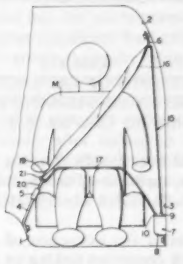
biasing means for moving said movable support member in the forward direction of said vehicle relative to said stationary base member when said locking means is disengaged; and

actuating means for actuating said seat locking means in association with said seat position memorizing means in response to the tilting movement of said seat back and including a lever member rotatably supported on said movable support member and biased one direction by a spring; a pin member firmly fixed to one end of said lever member, said pin member being engageable with said latch slot of said plate member of said seat position memorizing means to allow said lever member to rotate in said one direction at a predetermined angle by the assistance of said spring, first means for converting the tilting movement of said seat back to the rotational movement of said lever member so that when said seat back is tilted forwardly at a predetermined angle, said lever member is rotated in another direction against the force of said spring thus causing said pin member to disengage from said latch slot, and second means for transmitting the movement of said lever member to said locking means so that when said pin member is disengaged from said latch slot, said seat locking means is disengaged thus causing said movable support member to move in the forward direction by force of said biasing means.

4,101,170
SEAT BELT DEVICE FOR USE IN VEHICLE

Mamoru Mori, Okazaki, and Hiroshi Arai, Ohbu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 25, 1977, Ser. No. 762,337
Claims priority, application Japan, Feb. 19, 1976, 51-18752[U]
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—389 **3 Claims**



1. A seat belt device for use in a vehicle comprising:

a single retractor for taking up both a shoulder belt and a lap belt, said belts restraining a shoulder portion and a waist portion of an occupant and being formed to be continuous, said retractor having a single take-up shaft for simultaneously taking up said two belts;

a sash guide above the occupant's shoulders having a slit through which the belt freely passes;

a tongue plate for engaging with a buckle means and having an opening through which said belt freely passes; and

stopper means on the belt between the tongue plate and the sash plate, said stopper means being separate from the tongue plate and linearly moveable along the belt by manual manipulation but not so moveable due to pressing

force by the tongue plate, said stopper means being of such a configuration that it will not pass through the tongue plate opening, said stopper means being moveable to such a position along said belt that the shoulder portion thereof has sufficient length between the tongue plate and the retractor that the shoulders of the occupant are not unduly pressed by the belt upon attachment thereof.

4,101,171

TONGUE PLATE FOR SEAT BELT DEVICE

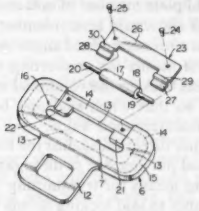
Shiro Sasaki, Toyota; Mitsuo Inukai, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Tokai Rika Denki Seisakusho K.K., both of Japan

Filed Jun. 27, 1977, Ser. No. 810,682

Claims priority, application Japan, Jul. 31, 1976, 51-103071[U]

Int. Cl.[2] A62B *35/00*

U.S. Cl. 297—389 **10 Claims**



1. A tongue plate for a seat belt device comprising;

a base plate constructed of a metal plate in which a buckle insert portion is formed integrally with a main frame portion of said base plate having a slot for passing a seat belt webbing of the seat belt device, and

a rotatable roller having a supporting shaft disposed in the face of the slot in the main frame portion at a peripheral side of the slot opposite to the buckle insert, where said seat belt webbing is in contact;

an outer peripheral surface of the main frame portion and end portions of said supporting shaft coated with a layer of synthetic resin having suitable thickness, said supporting shaft of said rotatable roller being carried by said layer of synthetic resin.

4,101,172

IN-SITU METHODS OF EXTRACTING BITUMEN VALUES FROM OIL-SAND DEPOSITS

Leonard C. Rabbitts, Big Chief Rd. R.R. #3, Orillia, Ontario, Canada

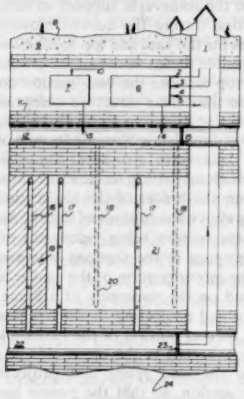
Filed Dec. 9, 1976, Ser. No. 748,822

Claims priority, application Canada, Dec. 22, 1975, 242305

Int. Cl.[2] E21B *43/25*; E21C *41/10*

U.S. Cl. 299—2 **40 Claims**

1. A method of in situ extraction of bitumen from an oil sands body which comprises sinking an access shaft through the oil sands body, driving a plurality of access drifts in the rock strata adjacent said oil sands body at least one access drift being in the rock strata underlying the oil sands body, providing at each of a plurality of locations spaced longitudinally along each access drift a plurality of bores extending in a fan-shaped pattern transversely of said access drift into said oil sands body to provide transverse rows of bores spaced longitudinally along said body in the direction of the access drifts, alternate transverse rows of bores defining rows of inlets and outlets for passage of fluid through said body, said outlets being in access drifts underlying said body, providing perforated pipes in those portions of the bores defining the outlets in said body, the perforations in the pipes being dimensioned to prevent said particles from said body passing therethrough, increasing the permeability of the body by causing fracturing of the body through the inlet bores to provide a fractured block of oil sands in said body defining an enclosed mining room capable of retaining liquids and gases under pressure surrounded by undisturbed solid pillar walls on all four sides of said room, sealing the ends of the access drifts to provide a closed reservoir system capable of delivering and removing fluid through said inlets and outlets and associated access



drifts, flooding the block at all elevations at substantially the same time via said inlets at a temperature and for a residence time sufficient to raise the temperature of the block by an amount to cause the bitumen to become flowable with said fluid and removing the fluid-bitumen mixture so formed from all desired levels in said block substantially at the same time through said outlets and associated access drift and separating said bitumen from said fluid.

4,101,173

ROOF PROP AND PLATFORM MOVABLY MOUNTED ON BOOM OF TUNNELLING MACHINE

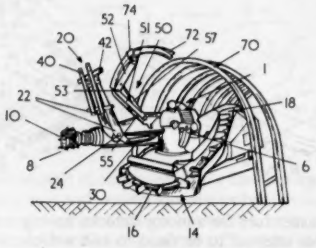
John Hedley Hodgkinson, Sutton-in-Ashfield, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,708

Claims priority, application United Kingdom, Feb. 13, 1976, 5725/76

Int. Cl.[2] E21D *9/04, 9/10*

U.S. Cl. 299—33 **11 Claims**



1. A mineral mining machine includes a mobile base unit, a forwardly extending cutter-carrying boom mounted on the base unit and adapted for vertical and horizontal movement, a conveyor assembly attached to the base unit and extending from the front of the unit to the rear thereof, the conveyor unit being adapted to collect and convey material at the front of the unit to the rear of the unit for discharge, and a face support structure pivotally attached to the boom and being adapted for movement independently of the movement of said boom be-

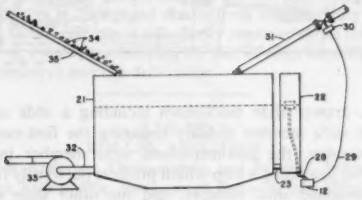
tween an inoperative position adjacent the boom and a face supporting position orthogonal or substantially orthogonal to the longitudinal axis of the boom.

4,101,174

SLURRY CONTROL SYSTEM

Thomas R. Miller, Waynesburg, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 25, 1977, Ser. No. 781,079
Int. Cl.[2] B65G *53/30, 53/66;* F16K *31/20*
U.S. Cl. 302—11 **4 Claims**



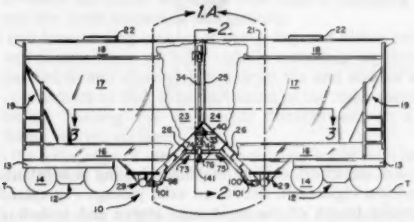
1. A slurry handling system for removing coal particles from the interior of a coal mine to the surface comprising:
(a) a slurry hopper located in the interior of a coal mine;
(b) a conveyor for feeding coal particles to said hopper;
(c) a controlled liquid inlet for feeding liquid to said hopper;
(d) a slurry pump connected to said hopper by a slurry outlet for discharging a slurry of said coal particles and said liquid from said hopper to a collecting point where coal particles may be separated from said liquid;
(e) a compartment in fluid communication with said hopper;
(f) a liquid-containing conduit having a first free end positioned in said compartment and adapted to float within said compartment at a level dependent on the level of fluid in said compartment; and
(g) a pressure transducer connected to said compartment and responsive to head pressure in said liquid-containing conduit, said pressure transducer being operatively connected to a control valve controlling said controlled liquid inlet to control the amount of said liquid being fed to said hopper in response to the liquid level in said hopper.

4,101,175

RAILWAY HOPPER CAR FOR UNLOADING LADINGS WHICH DO NOT READILY FLUIDIZE

George A. Kull, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 644,362, Dec. 24, 1975, abandoned.
This application Jul. 15, 1977, Ser. No. 815,887
Int. Cl.[2] B65G *53/12*
U.S. Cl. 302—53 **2 Claims**



1. A railway hopper car for the transport of ladings which do not readily fluidize comprising:
a railway car having at least two longitudinally spaced hoppers, the upper portion of which are in fluid communication; each of said hoppers having longitudinally spaced, inclined hopper slope sheets extending downwardly toward a transversely extending pressure discharge outlet located in the lower portion of each hopper; each outlet including a lading control valve for metering the lading into a discharge tube extending transversely of the car below its respective hopper; said discharge tube at opposite ends having a connection to receive a lading transfer conduit to convey the lading to a container; conduit connecting means located adjacent the car below said hopper slope sheets for receiving a source of air pressure; a first conduit extending from said source at least partially internally within at least one of said hoppers and comprising a standpipe extending vertically to the upper portion of the hopper; a sleeve in the upper portion of said one hopper and said standpipe being movable vertically within said sleeve; a pair of second conduits extending in opposite directions from said source, generally longitudinally of the car and then transversely and downwardly from said source below said hopper slope sheets to about the transverse mid portion of the car into respective first end portions of each of said discharge tubes; a pair of third conduits each in communication respectively with an end portion of the adjacent second conduit and extending respectively to the opposite end portion of the adjacent discharge tube; a first air control valve located in said first conduit below said hopper slope sheets to control the air pressure applied to the upper portion of the hoppers; a pair of second air control valves located in each of said second conduits adjacent its respective outlet for controlling air pressure applied to respective end portions of each of said discharge tubes; a pair of third air control valves located in each of said third conduits to control air pressure applied to the respective opposite end portions of said discharge tubes; whereby said first, second and third conduits are in compliance with AAR clearance requirements without modifying the structure of the hoppers to reduce the carrying capacity of the car, and whereby when the first air control valve is opened, air pressure is applied to the upper portion of each of said hoppers through said first conduit, passing within one of said hoppers to urge the lading downwardly, the lading control valve in the first hopper outlet being unloaded metering lading into the discharge tube located below the first hopper being unloaded; the second conduit in the outlet being unloaded applying pressure to assist in transporting the lading from the discharge tube into the container essentially entirely by pressure without significant fluidization, whereby the third air control valve in the outlet being unloaded may be opened to apply pressure to further assist in transporting the lading through the transfer conduit to the container essentially entirely by pressure without significant fluidization, and whereby after unloading said first hopper outlet, said lading transfer conduit may be removed from the discharge tube of the first outlet unloaded, and quickly attached to the second outlet to be unloaded, to unload the second hopper.

4,101,176

BRAKING CORRECTION DEVICE

Jean-Jacques Carré, Montreuil, and Yves Meyer, Taverny, both of France, assignors to Societe Anonyme DBA, Paris, France

Continuation of Ser. No. 666,837, Mar. 15, 1976, abandoned.
This application Apr. 25, 1977, Ser. No. 792,437
Claims priority, application France, Apr. 1, 1975, 75 10131
Int. Cl.[2] B60T *8/22*
U.S. Cl. 303—6 C **3 Claims**

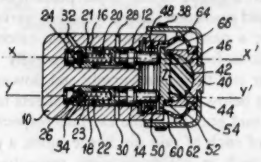
1. A brake correction device comprising:
a housing defining first and second bores therewithin;
first and second inlet ports respectively communicating with said first and second bores;
first and second outlet ports respectively communicating with said first and second bores;

a first correcting valve means mounted in said first bore between the first inlet and outlet ports;

a second correcting valve means mounted in said second bore between the second inlet and outlet ports;

each said first and second correcting valve means having a piston controlling communication between corresponding inlet and outlet ports, said piston having a projection movable therewith;

input lever means pivotally mounted with respect to said housing, said input lever means carrying a rigid element having a cavity and said rigid element being movable with



said input lever means when the latter is pivoted relative to said housing;

a block of elastomeric material disposed within the rigid element cavity, said block being movable with said rigid element and rotatable nondeformably within the rigid element cavity; and

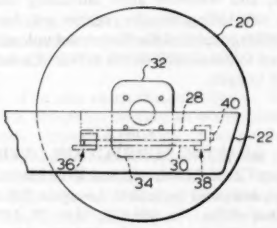
a rocker member engaging said block to retain the latter within the cavity and rotating with said block relative to the rigid element, said rocker member also engaging the projection of each piston to impart movement to each piston in one direction as said input lever means pivots relative to the housing.

4,101,177

IDLER WEAR STRIP RETAINER FOR TRACK-TYPE VEHICLES

Raymond A. Bianchi, Pekin, and Harry E. Campen, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 2, 1977, Ser. No. 802,611
Int. Cl.² B62D *55/10*
U.S. Cl. 305—31 **2 Claims**



1. An idler wear strip retainer for track-type vehicles comprising:

first and second retainer means secured to a frame portion of an associated vehicle for forming receptacles therewith and for engaging and retaining first and second ends, respectively, of the wear strip; and

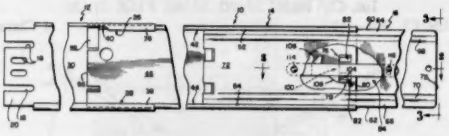
at least one of the retainer means is releasably secured to the frame portion.

4,101,178

LOCKING LEVER SAFETY STOP

Steven M. Adams, Indianapolis, and Joseph C. Monroe, Beech Grove, both of Ind., assignors to Herbert S. Fall, Indianapolis, Ind.

Filed Sep. 28, 1977, Ser. No. 837,170
Int. Cl.² F16C *29/00*
U.S. Cl. 308—3.6 **15 Claims**



1. A drawer slide mechanism including a slide member, another slide member slidably engaging the first-mentioned slide member, the first-mentioned slide member including means for providing a stop which projects outwardly from the first-mentioned slide member, and the other slide member including a lever movably mounted thereon and including a hook portion for engaging the stop to limit movement of the other slide member with respect to the first-mentioned slide member, the lever including first and second ends, the lever being provided with a slot adjacent the first end thereof, and means for movably attaching the slotted end of the lever to the other slide member to provide for limited movement of the lever to disengage the hook from the stop and allow the other slide member to be disengaged from the first-mentioned slide member.

4,101,179

DRILLING STABILIZER INCLUDING MECHANICAL INTERLOCK DEVICE

Alvie Barron, Dallas, Tex., assignor to Royal Tool Company, Inc., Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,686
Int. Cl.² F16C *1/26*
U.S. Cl. 308—4 A **5 Claims**

1. An improved drilling stabilizer having a substantially cylindrical rigid main sleeve, an axial passageway extending the entire length of the rigid main sleeve and including an inwardly extending fixed abutment means medially of the passageway, the innermost extent of which abutment means defines an opening of sufficient size to permit the sleeve to be slideably received over a drill collar, a flange extending radially outwardly of the rigid main sleeve, a clamping means positioned internally of the rigid main sleeve adjacent the fixed abutment means including first and second pairs of overlying inner and outer split rings each having a single opening, each

pair of split rings positioned on opposite sides of the abutment means, one ring of each pair of split rings engaging the abutment means, each pair of rings of sufficient diameter to be slideably received over the drill collar and having abutting conical surfaces oriented so that the axial movement of one split ring of each pair relative to the other split ring of the same pair results in a clamping or unclamping of the inner ring to the rigid main sleeve and the outer ring to the drill collar, and an end cap slideably and threadedly received by the rigid main sleeve to activate the clamping means, wherein the improvement comprises:

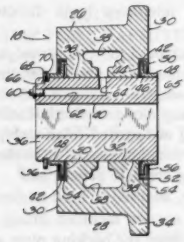
a mechanical interlock means for engagement of the outer split ring of one pair of rings to the end cap whereby the outer ring is disengaged axially from the inner ring of the pair as the end cap is threadedly removed from the main sleeve, thereby unclamping the pair of rings from the rigid main sleeve and the drill collar.

4,101,180

ROLLER ASSEMBLY

William B. Anderson, Oconomowoc, and Julius J. Yulga, Milwaukee, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jun. 13, 1977, Ser. No. 806,028
Int. Cl.[2] F16C *13/02*
U.S. Cl. 308—20 **10 Claims**



1. A roller assembly comprising:

(a) a roller member having an outer cylindrical rolling surface and substantially flat parallel end faces;

(b) a cylindrical bore extending through said roller member;

(c) a bushing journaled in said bore for relative rotational motion therein;

(d) a counterbore in each end face lying concentric with said bore and having an end wall parallel to the end face;

(e) a pair of inner sealing rings of L-shaped cross section, each having an axially extending leg and a radially extending leg and adapted to be pressed onto an end of said bushing and to be held thereon by an interference fit between the inside surface of said axially extending leg and the outer surface of said bushing;

(f) said inner sealing rings each being disposed within one of said counterbores with the radially extending leg thereof parallel to and closely spaced from the end wall of said counterbore to limit axial movement of the roller member on the bushing and to provide therebetween an axial thrust bearing surface;

(g) the outer edge of the radially extending leg of each inner sealing ring lying spaced from the surface of the counterbore;

(h) outer sealing ring mounted within each counterbore and having a radially extending leg lying axially spaced from the radially extending leg of said inner sealing ring and radially spaced from the axially extending leg of said inner sealing ring; and,

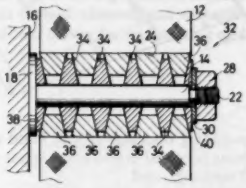
(i) the distance by which the radially extending legs of said inner sealing rings are spaced from the respective end walls of said counterbores is less than the distance by which the radially extending legs of said outer sealing rings are spaced from the respective radially extending legs of said inner sealing rings.

4,101,181

BEARING STRUCTURE FOR A ROTARY DISC

Keiichi Nakanishi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jan. 4, 1977, Ser. No. 756,602
Claims priority, application Japan, Jan. 8, 1976, 51-1040; Mar. 12, 1976, 51-29456
Int. Cl.[2] F16C *13/02*
U.S. Cl. 308—36 **11 Claims**



1. A bearing structure for rotatably supporting a rotary disc on a stationary shaft, said rotary disc having a central bore through which said stationary shaft is inserted, said bearing structure comprising:

a plurality of spaced first ring members coaxially mounted on said stationary shaft, each of said first ring members having at its each radial side first means defining a first conical surface concentric with said stationary shaft;

a plurality of spaced second ring members coaxially mounted on the surface of said central bore of said disc and meshing with said first ring members, each of said second ring members having at its each radial side second means defining a second conical surface concentric with said stationary shaft;

said first conical surface and said second conical surface being contiguously engaged with each other at their substantially entire portions; and

holding means for providing a tight contact between said first and second ring members and said stationary shaft, said holding means including two third ring members coaxially mounted on said stationary shaft at positions respectively engageable with two of said second ring members which two are respectively arranged at the axially outermost end positions of said plurality of spaced second ring members, each of said third ring members having at its one radial side third means defining a third conical surface concentric with said stationary shaft, said third conical surface and the second conical surface which is formed on the axially outer side of the corresponding one of said two second ring members being contiguously engaged with each other at their substantially entire portions; and urging means for urging said third ring members into tight contact with said two second ring members and thus providing a tight connection between said first, second and third ring members and said stationary shaft.

4,101,182

HOODS FOR RECORD PLAYERS

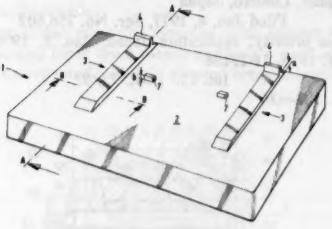
Josef Vavřina, Steinhofstrasse 9, and Benedikt Strausak, Merianweg 19, both of CH-3400 Burgdorf, Switzerland

Filed Aug. 18, 1976, Ser. No. 715,390
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537085
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—8 **1 Claim**

1. A pivoted covering hood for a record player having an

upper surface and a rear side about which said hood pivots, the improvement comprising:

a pair of spaced apart strips extending forwardly from said rear side, said strips extending upwardly from the hood upper surface and being dimensioned to support a record sleeve and space the same from said hood upper surface,



said hood including openings in said hood upper surface,

said strips being recessed in said hood upper surface and snap fit in said openings, and

stops disposed respectively on said strips and extending upwardly therefrom, said stops being positioned near said rear side.

4,101,183

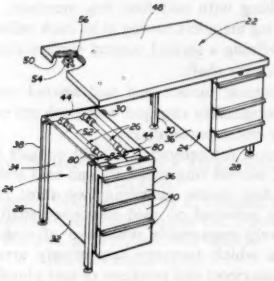
MODULAR OFFICE FURNITURE

Francis C. A. McManus, 5301 N. 13th St., Philadelphia, Pa. 19141

Filed Sep. 17, 1976, Ser. No. 724,201

Int. Cl.[2] A47B *27/00*

U.S. Cl. 312—195 **2 Claims**



1. Modular office furniture adapted for rapid and simple assembly and disassembly comprising a generally planar top module adapted for use as a table top and a desk surface, a pedestal module comprising a pedestal shell and a pedestal top for supporting said top module and quick-acting snap connecting means for securing said top module onto said pedestal module, said snap connecting means including a first component in the form of a pair of cylindrical locking rods and a second component in the form of at least two clips, each having a resilient mouth into which an associated rod is adapted to be snap-fit, said snap connecting means also comprising a respective pair of guide rings secured to each of said locking rods and spaced apart by the length of said clip to permit said clip to fit therebetween when said rod is within said clip mouth to prevent longitudinal relative movement between said rod and clip, one of said components being permanently secured to said top module and the other component being permanently secured to said pedestal module, with the module to which said locking rods are secured having two pairs of support members permanently secured thereto, each of said support members including a recess in which an end portion of a respective rod is disposed and permanently secured to fastening means, said support members serving to hold said rods parallel to but away from said module to facilitate the securement of said clips to said rods, said pedestal top including a flanged stop abutting an end of each of said rods to longitudinally position said rods with respect to said support members.

4,101,184

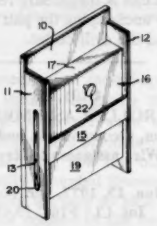
TELEPHONE BOOK HOLDER

Warren E. Barrett, 1198 Topeka St., Pasadena, Calif. 91104

Filed Aug. 13, 1976, Ser. No. 714,187

Int. Cl.[2] A47B *41/06*

U.S. Cl. 312—233 **3 Claims**



1. A holder for telephone book directories and the like comprising

a backing plate adapted to be mounted on a wall;

a pair of spaced apart side panels extending from one face of the backing plate;

a vertical extending elongate slot in each of the said panels, said slots being in opposed relationship;

a carrier support member spaced from the backing plate and interconnecting the side panels; and

a carrier member, adapted to hold a telephone directory, or the like, said carrier member fitting between the side panels and between the backing plate and carrier support member and having pins projecting from a lower end thereof and into the elongate slots of the side panels, a facing panel extending between the side panels and having a face adapted to extend sufficiently close to the carrier support member that said corner support member will act as a pivot for the facing panel, and top and bottom plates respectively extending from the facing panel and between the side panels, said top and bottom plates extending closely adjacent to the backing plate whereby said top plate will hold the directory on the facing panel when the directory is being displayed and the bottom plate will hold the directory on the facing panel when the directory is being stored.

4,101,185

METHOD FOR PRODUCING A LOW-PRESSURE GAS DISCHARGE LAMP

Johannes van Esdonk; Jan Hasker, and Johannes Cornelis Gerardus Vervest, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1977, Ser. No. 764,588

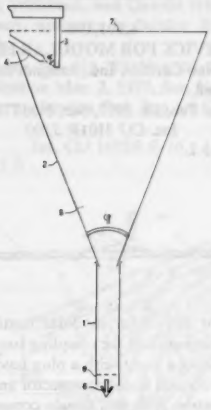
Claims priority, application Netherlands, Mar. 18, 1976, 7602824

Int. Cl.[2] H01J *9/18*

U.S. Cl. 316—19 **14 Claims**

1. A method for producing a low-pressure discharge lamp which comprises: providing a lamp envelope, said envelope including walls defining a tubular discharge space, providing a body comprising filaments of solid material elements, said body being permeable to a gas discharge, providing coherence to said filaments in a second space adjacent to said tubular

discharge space by subjecting said filaments to a gas current and by whirling said filaments, then sucking said filaments into



said discharge space, and completing the manufacture of said lamp.

4,101,186

CONTACT CLAMP FOR GRAPHITE ELECTRODES

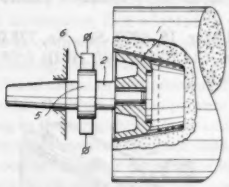
Georgi Metev Georgiev; Peter Lazarov Shivachev; Todor Yankov Koychev; Lyuben Kostov Lazov, and Alexander Yordanov Valchev, all of Sofia, Bulgaria, assignors to DSO "Cherna Metalurgia", Sofia, Bulgaria

Filed Mar. 2, 1977, Ser. No. 773,754

Claims priority, application Bulgaria, Mar. 3, 1976, 32515

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—5 S **4 Claims**



1. A contact clamp for a graphite electrode comprising:

a shaft formed adjacent one end with a conical portion, and adjacent the other end with a neck portion;

a metal hub formed as a truncated cone and seated on said neck portion, said hub being receivable in a conical seat formed in said electrode;

a current-carrying disk on said shaft and in electrical connection with said electrode; and

current-supplying brushes in contact with said disk.

4,101,187

SOCKET FOR WEDGE BASE BULBS

Ben C. Collier, 6121 S. Monticello Dr., Montgomery, Ala. 36109

Filed Jun. 30, 1977, Ser. No. 811,871

Int. Cl.[2] H01R *33/06*

U.S. Cl. 339—59 L **2 Claims**

1. A socket for releasably receiving a wedge base bulb of the type having an envelope and a pair of exposed conductors on the exterior of the base thereof and for also releasably receiving preassembled conductive wire and clip means, said socket comprising

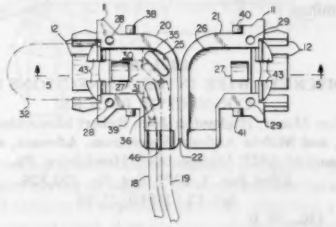
first and second socket halves molded from a rigid polymeric material;

a hinge member integrally formed with said socket halves and interconnecting said halves so that they can be relatively moved between an open position and a closed position;

each of said halves having means defining a recess extending between opposite ends thereof so that, when said halves are moved to said closed position, said recesses form a channel through the socket, one end of said channel being dimensioned to enclose said clip means and to receive the base of said bulb;

one of said halves having means at the other end of said channel for receiving a pair of wires and for maintaining said wires in spaced relationship;

said one of said halves having means in said recess intermediate the ends of said channel and extending toward the other one of said halves for maintaining said clip means in



spaced relationship and in proper position when a bulb is inserted into said one end of said channel to engage said clip means; and

latch means integrally formed on said halves for retaining said halves in said closed position;

and wherein said preassembled wire and clip means includes

a pair of wires each having an exposed end portion, the remainder thereof being covered with an insulating material;

a pair of identical, generally U-shaped metal clip members each dimensioned to engage a conductor on the base of said bulb;

each of said members having integrally formed thereon a connector for frictionally and securely engaging said exposed end portion.

4,101,188

FIBER OPTIC SYSTEM

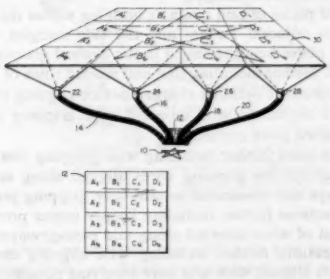
George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 223,612, Feb. 4, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,355

Claims priority, application Israel, Jan. 17, 1973, 41332

Int. Cl.[2] G02B *5/16*

U.S. Cl. 350—96.24 **13 Claims**



1. An optical system including:

(a) A plurality of coherent light guides having their input termini positioned at and defining an object surface,

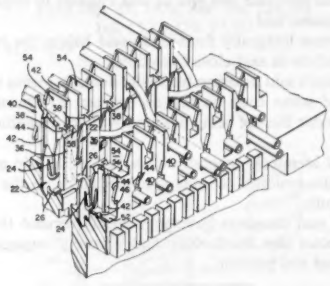
(b) said coherent light guides diverging from each other over at least a portion of their length,
(c) the distance between the output termini of said guides being greater than the distance between the input termini,
(d) the output termini of said coherent light guide being rigidly positioned relative to each other,
(e) a light receiving surface adjacent said output termini and adapted to receive output projected therefrom,
(f) the said output termini each provided with a projecting lens interposed between it and said light receiving surface,
(g) means for compensating for image inversion of the projected optical output of each coherent light guide on said light receiving surface,
(h) the output termini of said coherent light guides extending into and supported by a panel and wherein said projection lenses are Lister doublets, the optic axis of each Lister doublet coinciding with the center of its respective output terminus.

4,101,189

DISCRETE WIRE INTERCONNECTIONS FOR CONNECTOR BLOCKS

Jessie Lee Moser, Highpoint; John Robert Shoemaker, Walkertown, and Melvin Andrew Soderstrom, Advance, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 1, 1977, Ser. No. 802,326
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **5 Claims**



1. In a connector block capable of being interconnected by discrete wires, the improvement comprising:
first and second rows of electrical contacts along opposite sides of said block having resilient contacts on opposite sides of a central cavity of said block and tail portions in the form of slotted plates projecting outwardly of said block,
said block including two rows of supporting flanges provided with aligned grooves facing the spaces defined between adjacent flanges,
the slotted plates of said contacts bridging across the spaces between adjacent flanges and the side margins of said slotted plates being received in the aligned grooves,
said block further including first and second rows of columnar projections defining elongated wire aligning passageways in alignment with adjacent wire gripping jaws of said slotted plate contacts,
said projections further including wire gripping ribs in said passageways for gripping wires aligned along said passageways and terminated to said wire gripping jaws,
said projections further including keeper means preventing removal of wires inserted along said passageways,
said projections further including wire aligning elongated channels aligned with said wire receiving passageways of the opposite rows of projections, whereby wires aligned in said channels span transversely across said block and are terminated to wire receiving jaws of slotted plate contacts adjacent said opposed row of projections and are gripped by said ribs in said wire receiving passageways.

4,101,190

INDICATOR DEVICE FOR MODULAR HEATING CABLE

Dale H. Schoff, New Carlisle, Ind., assignor to Bristol Products, Inc., Bristol, Ind.

Filed Feb. 28, 1977, Ser. No. 772,731
Int. Cl.[2] H01R *3/00*
U.S. Cl. 339—113 L **12 Claims**

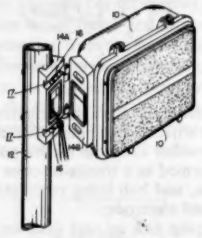
1. An indicator device for modular heating cables having male and female connectors for coupling two heating modules together, comprising a body with a plug having two terminals for connection with said female connector and forming a moisture proof connection with said female connector and a socket having two terminals for connection with said male connector and forming a moisture proof connection with said male connector, a pair of electrical conducting means connecting the terminals of said plug with the respective terminals of said socket, an indicator light means connected to said body in sealed relationship therewith and having a pair of leads, and means connecting said leads of said indicator light means to each of said electrical conducting means.

4,101,191

MOUNTING BRACKET ASSEMBLY FOR PEDESTRIAN TRAFFIC SIGNAL

James S. Gould, Los Alamitos, and Samuel Gould, San Pedro, both of Calif., assignors to Indicator Controls Corporation, Gardena, Calif.

Filed Mar. 16, 1977, Ser. No. 778,077
Int. Cl.[2] E01F *9/01;* **H02B** *1/08*
U.S. Cl. 339—125 R **9 Claims**

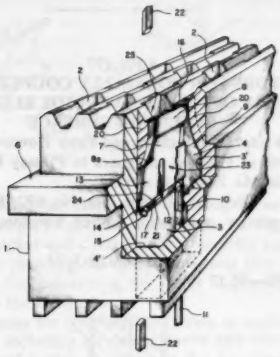


1. In combination: an upright pole; a rectangular-shaped pedestrian traffic signal unit; a two-piece bracket for removably mounting the signal unit on the pole, said bracket including a first cavity-defining piece mounted on the pole having an open front and including an opening in the back thereof for receiving electric wires from the interior of the pole, a second cavity defining piece mounted on one side of the pedestrian traffic signal unit having an open front and including an opening in the back thereof for receiving electric wires from the interior of the unit, hinge means mounted on the first and second pieces to permit the second piece to be removably hinged to the first piece, the first and second pieces being shaped to define an enclosure for the electric wires therebetween within the cavities defined thereby when the two pieces are turned about the axis of said hinge means into facing juxtaposed relationship.

4,101,192
ELECTRICAL CONNECTOR WITH RELEASABLE CONTACT MEMBERS

Gerhard Bäuerle, Willsbach, and Oswald Hübner, Neuenstadt, both of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 631,282, Nov. 12, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,668
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1974, 2454317
Int. Cl.[2] H01R *9/16*
U.S. Cl. 339—217 S 8 Claims



1. An electrical connector comprising:

an insulating body having opposite termination and mating contact faces and at least one contact receiving chamber extending through said body and opening at each of said faces, said termination face adapted to receive wires for connection to connector contact members;

said body including, in each chamber, a locking shoulder on one wall of said chamber and positioned to lock a contact member within the chamber and prevent removal through the opening in the termination face; and

at least one contact member disposed within each chamber, each said contact member including a locking tab engaging said locking shoulder to lock said contact member in a fixed position, said locking tab being releasable from engagement with said locking shoulder by the insertion of a releasing tool to move said locking tab away from said locking shoulder and permit removal of the contact through the opening at said termination face, the improvement comprising:

a releasing shoulder means for the outward release of the contact member through the termination face protruding laterally of said locking tab so as to be positioned laterally adjacent said locking shoulder when said contact member is locked in said fixed position;

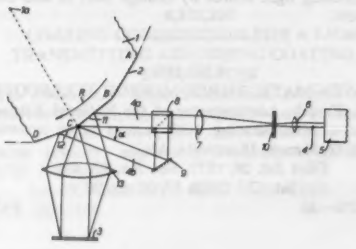
means defining a first passageway leading from said termination face to said releasing shoulder means for insertion of a releasing tool to engage and displace said releasing shoulder means and thereby effectuate sufficient concurrent movement of said locking tab to release the latter from locking engagement with said locking shoulder and permit removal of the contact through the opening at said termination face without insertion of a releasing tool from said mating contact face; and

a second passageway leading from the mating contact face for insertion of a releasing tool to engage and displace said locking tab to release the latter from locking engagement with said locking shoulder.

4,101,193
SCANNING SYSTEM

Peter Waterworth, Towcester, and Douglas Charles John Reid, St. James, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Feb. 11, 1977, Ser. No. 767,822
Claims priority, application United Kingdom, Feb. 13, 1976, 05714/76
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.8 9 Claims

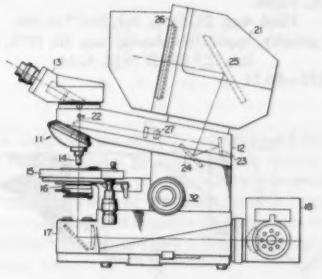


1. A scanning system which includes a rotatable multifaceted polygon having an angle ϕ between adjacent facet edges, the faceted surfaces of which are optically reflective; a recording means spaced-apart from the said polygon and adapted to move in a direction parallel to the rotational axis of the polygon; light generating means for generating at least 2 light beams, directing means for directing the 2 light beams at different angles onto the faceted surface and in contact with each other at said faceted surface in a non-overlapping relationship; modulating means for modulating the said at least two light beams; and first focussing means interposed between the said polygon and the said recording means for focussing said two light beams reflected from the said polygon onto the said recording means to produce two complete scans of the recording means for a single angle rotation ϕ of the polygon.

4,101,194
SCREEN MICROSCOPE WITH VARIABLE ILLUMINATION

Kensaku Miyazaki, Machida, and Toshio Shinohara, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1976, Ser. No. 705,172
Claims priority, application Japan, Aug. 27, 1975, 50-102886
Int. Cl.[2] G02B *21/36, 21/56*
U.S. Cl. 350—9 3 Claims



1. A screen microscope comprising an arm mounted to a microscope body, an objective mounted to said arm, an eyepiece arranged on said arm, a projection screen means having a screen and arranged on said arm adjacent to said eyepiece, a movable reflecting mirror arranged in said arm so that said

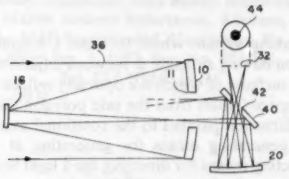
movable reflecting mirror can be aligned with and removed from the optical axis of said objective, other reflecting mirrors arranged in said arm and arranged to direct the light passed through said objective and reflected by said movable reflecting mirror toward said screen, an illuminating light source mounted to said microscope body, and a change-over switch provided in said arm and arranged so that said change-over switch is changed over in combined operation with movement of said movable reflecting mirror for aligning it with and removing it from the optical axis of said objective, said screen microscope being arranged to vary the intensity of light from said illuminating light source by change over of said change-over switch.

4,101,195

ANASTIGMATIC THREE-MIRROR TELESCOPE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Dietrich G. Korsch, Huntsville, Ala.

Filed Jul. 29, 1977, Ser. No. 820,498
Int. Cl.[2] G02B *17/06, 23/06*
U.S. Cl. 350—55 **4 Claims**



1. A three-mirror telescope comprising:

a primary mirror of ellipsoidal configuration, and having an opening central about a central axis thereof;

a secondary mirror of hyperboloidal configuration facing said primary mirror, said secondary mirror being of a smaller diameter than the primary mirror and positioned symmetrically with the axis of the primary mirror, whereby light from a scene being viewed passes around and by the secondary mirror, and then is reflected through said opening in said primary mirror; and

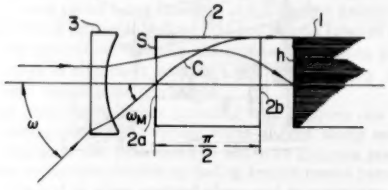
imaging means, including a tertiary mirror of ellipsoidal configuration positioned to receive light from said secondary mirror, for reflecting an image of the scene being viewed to a plane for viewing.

4,101,196

OBJECTIVE OPTICAL SYSTEM FOR ENDOSCOPES

Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Aug. 23, 1976, Ser. No. 716,804
Claims priority, application Japan, Aug. 30, 1975, 50/104521
Int. Cl.[2] G01B *5/16, 5/14*
U.S. Cl. 350—96.31 **3 Claims**



1. An objective optical system for endoscopes comprising an optical fiber bundle for transmitting an image of an object and a cylindrical light-focusing heterogeneous medium arranged near the end face of said optical fiber bundle on the object side and having refractive index distribution n given by the following formula:

$$n = n_0(1 - \tfrac{1}{2}\alpha R^2)$$

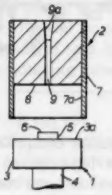
wherein reference symbol n_0 represents refractive index on the optical axis, reference symbol α represents the coefficient of refractive index distribution and reference symbol R represents the distance from the optical axis, said optical system further comprising a negative lens arranged on the object side of said light-focusing heterogeneous medium.

4,101,197

CONNECTORS FOR COAXIALLY COUPLING THE END OF A LINEAR OPTICAL WAVEGUIDE ELEMENT FOR A RECEIVING SURFACE

Alan Hugh Kent, Wokingham, and Peter Howard Fell, Maidenhead, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 4, 1976, Ser. No. 692,782
Claims priority, application United Kingdom, Jun. 6, 1975, 24467/75
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.17 **4 Claims**

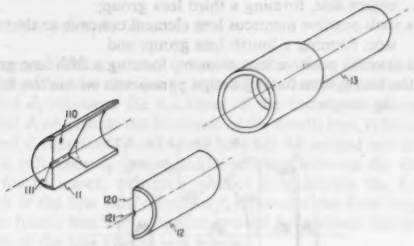


1. A connector for coupling the end of an optical waveguide element to a small-area light-receiving surface, which comprises a first connector member having a substantially rigid body and an end face on which the light-receiving surface is fixedly arranged, and a second connector member having a substantially rigid body formed with a coupling face at one end and with a cylindrical longitudinal through bore penetrating said coupling face at right angles to said face for closely surrounding the end of such waveguide element, said bore having a flared lead-in portion at its end remote from said coupling face, the body of the first connector member including a boss-like structure and the body of the second connector member including at its outer circumference a longitudinally projecting tubular part which presents an inner circumferential surface for slidingly receiving said boss-like body of said first connector member with such longitudinal penetration that said light-receiving surface is substantially in contact with said coupling face, said tubular part and said boss-like body being in such fixed relation to said cylindrical bore, and to said receiving surface respectively, as to each be parallel and substantially coaxial respectively with said bore and with an axis that extends through the centre of said light-receiving surface at right angles to the latter and in which the body of the second connector member has an end portion in which the end of the said waveguide element is centred and which, at least at that end which, in the coupled position of said first and second connector members, is nearest to the receiving surface, is enclosed in a cylindrical holder tube which extends beyond the end of the said end portion, to form a collar adapted to encircle the boss of the first connector member, and having a cylindrical bore for sliding cooperation with the cylindrical outer surface of the boss.

4,101,198
FIBER OPTIC CONNECTOR WITH SPLIT FERRULE ASSEMBLY

Earl R. Heldt, Monta Vista, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 21, 1976, Ser. No. 698,392
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.20 7 Claims

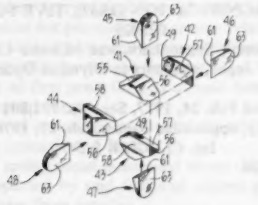


1. A connector for end-to-end coupling of an individual optical fiber cable to another, each cable having an optical fiber, a fiber jacket and a cover, said connector comprising:
a ferrule for retaining the optical fiber and fiber jacket;
boot means for maintaining the cover in gripping relationship with the ferrule; and
coupling means for coupling the ferrule to another ferrule;
said ferrule including a retainer sleeve and two half-shells, each of said half-shells having a flat face formed with a coaxially aligned groove to provide a bore of substantially uniform diameter for slidably retaining the optical fiber when mounted in the retainer sleeve.

4,101,199
RADIATION BEAM SPLITTER

Craig M. Christensen, Atherton, Calif., assignor to Noctua, Inc., Belmont, Calif.

Division of Ser. No. 621,709, Oct. 14, 1975, Pat. No. 4,036,557.
This application Jan. 24, 1977, Ser. No. 761,833
Int. Cl.[2] G02B 27/28, 27/10
U.S. Cl. 350—152 6 Claims

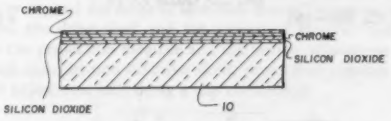


1. A radiation beam splitter for use in generating a pair of mutually parallel coherent radiation beams from a coherent radiation input beam having orthogonal polarization components, said radiation beam splitter comprising:
a plurality of Amici prisms each having opposing end faces and intermediate roof faces extending therebetween, said roof faces of different ones of said plurality of Amici prisms being arranged in facing relation, one of said roof faces of each of said Amici prisms including beam splitting means for reflecting a preselected fractional portion of at least one of said orthogonal polarization components of said input beam and for transmitting the remaining fractional portion of said at least one of said orthogonal polarization components to the interior of the associated Amici prism; and
a plurality of reflecting prisms each associated to a different one of said Amici prisms, each said reflecting prism having a radiation input face coupled to one of said end faces of the associated one of said Amici prisms, a radiation output face, and a reflecting surface having a relatively high coefficient of reflectivity, said reflecting prisms each being arranged so that radiation entering said input face from the associated one of said Amici prisms is totally internally reflected by said output face, reflected by said reflecting surface and emerges from said output face.

4,101,200
COATING COMPOSITION FOR A LIGHT TRANSMITTING ABSORBING COATING ON SUBSTRATES

Helmut Daxinger, Wangs, Switzerland, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed Mar. 8, 1976, Ser. No. 664,424
Claims priority, application Switzerland, Mar. 7, 1975, 3390/75
Int. Cl.[2] G02B 5/23; C23C 15/00; G02B 5/28
U.S. Cl. 350—166 9 Claims

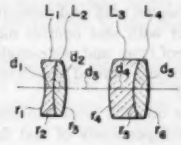


1. A light transmitting filter having a blue-gray transmission color, in particular a sight glass, comprising a substrate of a transparent material and a coating on said substrate of alternate metal and non-metal layers, said metal layers consisting essentially of chromium and having a thickness of less than 10 nm, and said non-metal layers consisting essentially of silicon dioxide.

4,101,201
LOW MAGNIFICATION MICROSCOPE OBJECTIVE

Tsutomu Tojyo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Dec. 27, 1976, Ser. No. 754,634
Claims priority, application Japan, Dec. 26, 1975, 51/157485
Int. Cl.[2] G02B 9/02, 21/02
U.S. Cl. 350—175 ML 1 Claim



1. A low magnification objective comprising a first negative cemented lens component having a concave surface facing the object side and consisting of a biconcave lens element and a biconvex lens element, and a second positive cemented lens component consisting of a negative meniscus lens element and a biconvex lens element, and said objective having the following numerical data:

f = 1			
$r_1 = -0.2703$	$d_1 = 0.0492$	$n_1 = 1.51633$	$\nu_1 = 64.1$
$r_2 = 1.0278$	$d_2 = 0.0527$	$n_2 = 1.71285$	$\nu_2 = 43.4$
$r_3 = -0.5009$	$d_3 = 0.2530$		
$r_4 = 0.7140$	$d_4 = 0.1230$	$n_3 = 1.78472$	$\nu_3 = 25.7$
$r_5 = 0.3562$	$d_5 = 0.0735$	$n_4 = 1.50378$	$\nu_4 = 66.8$

-continued

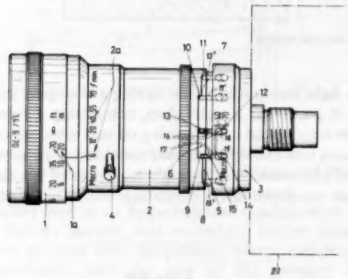
f = 1
$r_6 = 0.7532$

wherein the reference symbol f represent the overall focal length of the objective as a whole, the reference symbols r_1 through r_6 designate radii of curvature on respective lens surfaces, the reference symbols d_1 through d_5 denote thicknesses of respective lens elements and the airspace therebetween, the reference symbols n_1 through n_4 represent refractive indices of respective lens elements and the reference symbols ν_1 through ν_4 designate Abbe's numbers of respective lens elements.

4,101,202
VARIFOCAL CAMERA OBJECTIVE WITH ADJUSTMENT-RANGE SELECTION

Karl Tesch, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany

Filed Dec. 10, 1976, Ser. No. 749,332
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555953
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—187 **4 Claims**



1. In a camera having a varifocal objective provided with control means displaceable between a telephoto position and a wide-angle position for adjusting the focal length of the objective in a zoom range, said control means being further displaceable beyond said wide-angle position for focusing the objective upon nearby objects in a macro range, the combination therewith of:

first stop means coupled with said objective and selectively settable to coact with said control means for blocking movement thereof from said wide-angle position toward said telephoto position beyond a predetermined intermediate position; and

second stop means coupled with said objective and selectively settable independently of said first stop means to coact with said control means for blocking movement thereof away from said telephoto position past said wide-angle position.

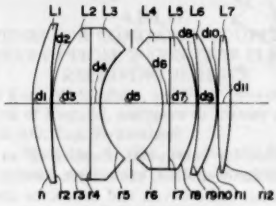
4,101,203
GAUSS TYPE LENS SYSTEM

Tamikazu Yamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 6, 1977, Ser. No. 757,213
Claims priority, application Japan, Jan. 12, 1976, 51/3001
Int. Cl.[2] G02B *9/60*
U.S. Cl. 350—217 **9 Claims**

1. A five group, seven element Gauss type lens system comprising, from the object side to the image side of the lens system;

a first positive meniscus lens element convex to the object side, forming a first lens group;
a second positive lens element;
a third negative lens element cemented to the second lens element to form a meniscus-shaped doublet convex to the object side, forming a second lens group;
a fourth negative lens element;
a fifth positive lens element cemented to the fourth lens element to form a meniscus-shaped doublet concave to the object side, forming a third lens group;
a sixth positive meniscus lens element concave to the object side, forming a fourth lens group; and
a seventh positive lens element, forming a fifth lens group,
the lens system having design parameters within the following ranges:



$$1.7 < r8/r6 < 1.9,$$

$$0.9 < r10/r8 < 1.2,$$

$$0.67 < (d_6 + d_7)/(d_3 + d_4) < 0.87,$$

$$1.65 < n2 < 1.72,$$

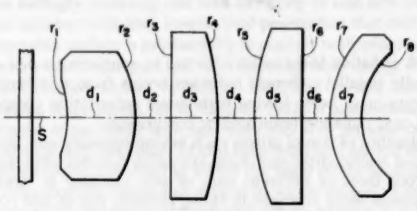
$$n5 > 1.72;\ n6 > 1.72$$

wherein,
r represents the radius of curvature,
d represents the value of the axial distance, and
n represents refractive index,
the sub-numbers correspond to the consecutive values from the object to image side of the lens system.

4,101,204
MEDIUM MAGNIFICATION OBJECTIVE FOR VIDEO DISKS

Toshimichi Koizumi, Sagamihara, and Miwako Unami, Yokohama, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Feb. 24, 1977, Ser. No. 771,801
Claims priority, application Japan, Feb. 27, 1976, 51-20147
Int. Cl.[2] G02B *9/34*
U.S. Cl. 350—224 **7 Claims**



1. A medium magnification objective for video disks comprising a first, second, third and fourth lenses, said first lens being a positive meniscus lens with its concave surface positioned toward the object side, said second lens being a positive meniscus lens with its concave surface positioned toward the object side, said third lens being a biconvex lens, said fourth

lens being a negative meniscus lens with its convex surface positioned toward the object side, said medium magnification objective for video disks satisfying the following conditions:

$$0.3 \geqq d_6/f \geqq 0.06 \quad (1)$$

$$0.41 \geqq d_7/f \geqq 0.28 \quad (2)$$

$$2 \geqq |f_4|/f_1 \geqq 1 \quad (3)$$

$$0.45 \geqq d_4/f \geqq 0.25 \quad (4)$$

$$1.7 \geqq |r_2|/d_1 \geqq 1.5 \quad (5)$$

Wherein reference symbol r_2 represents the radius of curvature of the surface on the image side of the first lens, reference symbol d_1 represent the thickness of the first lens, reference symbol d_7 represents the thickness of the fourth lens, reference symbol d_4 represents the airspace between the second and third lenses, reference d_6 represents the airspace between the third and fourth lenses, reference symbol f_1 represents the focal length of the first lens, reference f_4 represents the focal length of the fourth lens and reference symbol f represents the focal length of the lens system as a whole.

4,101,205

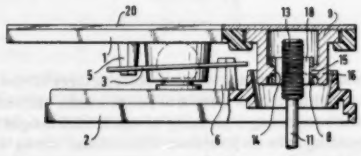
DRIVING MIRROR ASSEMBLY

Horst Bös, Göppingen, Fed. Rep. of Germany, assignor to Gebr. Marklin & Cie. GmbH, Goppingen, Fed. Rep. of Germany

Filed Aug. 9, 1976, Ser. No. 713,061

Int. Cl.² G02B *5/08*

U.S. Cl. 350—289 **3 Claims**



1. A driving mirror assembly comprising:

a base;

a carrier for a mirror glass the mirror glass, said carrier being supported on said base by means of a universal joint;

first means for pivoting said carrier relative to said base about a first axis passing through said universal joint;

second means for pivoting said carrier relative to said base about a second axis passing through said universal joint and perpendicular to said first axis;

a plurality of first posts formed on said base and extending towards said carrier;

a plurality of second posts formed on said carrier and extending towards said base;

a sheet of spring metal positioned about said universal joint and supported by said first and second posts to prevent said carrier from rotating.

4,101,206

ADJUSTABLE MOTOR CAR MIRROR WITH COMPACT ELECTRICALLY DRIVEN ADJUSTING MEANS

Aane Adriaan Oskam, De Meern, and Hermanus Marinus Ignatius Koot, Linschoten, both of Netherlands, assignors to Industrie Koot B.V., Montfoort, Netherlands

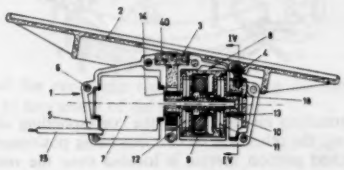
Filed Dec. 17, 1976, Ser. No. 751,709

Claims priority, application Netherlands, Apr. 9, 1976, 7603821; Sep. 14, 1976, 7610173

Int. Cl.² G02B *5/08, 7/18*

U.S. Cl. 350—289 **12 Claims**

1. A device for adjusting a motor car mirror around two substantially perpendicular axes, comprising a housing, a reversible motor in said housing, an electromagnetically operated clutch in said housing and connected to said motor, two planetary transmission assemblies in said housing and to which said clutch is connected for operating one or the other of said transmission assemblies, each transmission assembly having a drive shaft, a projection member mounted on each drive shaft, and two mirror adjustment units, one having one end connected to said projection member on said drive shaft of one transmission assembly and having the other end adapted to be connected to a mirror structure for tilting said mirror structure around one of said axes, and the other having one end connected to said projection member on said drive shaft of the other transmission assembly and having the other end adapted to be connected to the mirror structure for tilting the mirror structure around the other of said axes, one of the connections between the drive shaft and the projection member and between the projection member and the mirror adjustment unit for each combination of drive shaft, projection member and mirror adjustment unit being a slip connection.



4,101,207

PREPARATION OF LIQUID CRYSTAL CONTAINING POLYMERIC STRUCTURE

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 331,445, Feb. 12, 1973, abandoned, which is a continuation of Ser. No. 121,156, Mar. 4, 1971, abandoned. This application Apr. 18, 1977, Ser. No. 788,577

Int. Cl.² G02F *1/13*

U.S. Cl. 350—344 **5 Claims**

1. As an article of manufacture, an electronic display device comprising:

(a) at least one base member,

(b) a thin, layer-like structure of controlled thickness supported on a surface of said base member,

(c) said structure comprising poly(ethylene oxide) in matrix form and N,N'-bis(p-n-octyloxybenzylidene)-2-chloro-1,4-phenylenediamine nematic liquid-crystal material;

(d) said nematic liquid-crystal material being dispersed in said poly(ethylene oxide) matrix in intimate contact therewith, and said poly(ethylene oxide) being chemically and physically inert relative to the contained liquid-crystal material, and

(e) means for applying an electric field to selected areas of said structure to produce a dynamic scattering effect in said nematic liquid-crystal materail.

4,101,208

OPHTHALMIC DEVICE FOR TENSIONALLY SECURING LENSES THERETO

Louis J. Page, 191-21 Hillside Ave., Hollis, N.Y. 11423

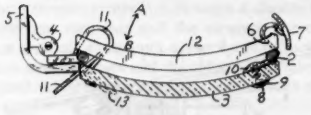
Filed Jan. 17, 1977, Ser. No. 760,184

Int. Cl.² G02C *9/04*

U.S. Cl. 351—58 **10 Claims**

1. An ophthalmic device having a pair of spaced rim members connected by a bridge member, each of said rim members extending at least partially along the peripheral portion of a lens, the upper portion of said rim member being located substantially above eye level when worn, lens attaching means being attached to the nasal and temporal side portions of said rim member and having portions thereon extending rearwardly therefrom and having a spring relationship to each other so that the confronting surfaces of the attaching means

can be sprung apart relative to each other and having the distance between the attaching means less than the distance between the side portions of a lens inserted therein, lenses, at least one of said lenses being provided with at least one temporal and one nasal notch formed in the respective side edge portions thereof and at least one of said lenses being attached to each of said rim members, said lens being positioned so that one



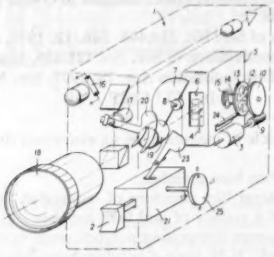
of said attaching means engages the corresponding side notch in the lens, the other side of said lens being positioned so that the notched portion therein is located over the rear of the corresponding side attaching means and is pressed against the attaching means whereby the attaching means yields relative to the other of said attaching means allowing the lens to enter therein, thereby tensionally and releasably securing the lens to said rim member.

4,101,209

CINE CAMERA

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Sep. 8, 1976, Ser. No. 721,222
Claims priority, application Austria, Sep. 8, 1975, 6899/75
Int. Cl.[2] G03B *21/36*
U.S. Cl. 352—91 C **22 Claims**



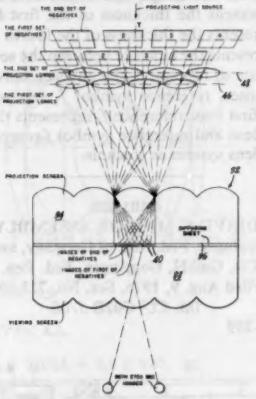
1. In a cine-camera for cinematographic film
optical means defining an optical axis;
means for guiding the film and for exposing successive image frames on said optical axis;
shutter means for intercepting said optical axis and being operable to alternately assume an intercepting condition and an open condition;
first drive means for said film and said shutter;
motor means for providing power for said first drive means;
fading means operable between an open condition and a fade-out condition for continuously altering the amount of light reaching the image frame on said optical axis;
release means for controlling the operation of said drive means and being movable from an inoperative position into a first operative position for rendering operative said drive means, and from the first into a second operative position to operate said fading means;
blocking means for preventing movement of said release means from the first into the second position, said blocking means having a blocking and an unblocking condition;
programming means being controlled by said release means and controlling said blocking means the blocking means after the movement of the release means from the inoperative into the first operative position remaining in blocking condition during a time interval determined by the programming means and then assuming the unblocking condition to allow the release means to be moved into the second operative position for operating the fading means.

4,101,210

PROJECTION APPARATUS FOR STEREOSCOPIC PICTURES

Allen Kwok Wah Lo, and Jerry Curtis Nims, both of Dunwoody, Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Filed Jun. 21, 1976, Ser. No. 698,064
Int. Cl.[2] G03B *21/00*
U.S. Cl. 353—7 **10 Claims**

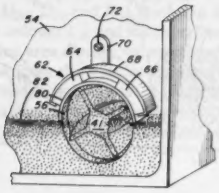


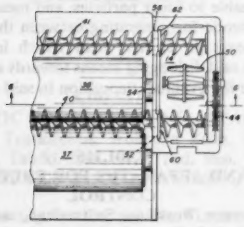
1. Apparatus for forming stereoscopic pictures of the type including a multiplicity of lineiform image bands, each of said image bands comprising a plurality of condensed images from a corresponding plurality of two-dimensional views of an object field taken from spaced vantage points, and a lenticular screen having a corresponding multiplicity of lenticules aligned with the image bands, said apparatus comprising:
a lenticular screen having a plurality of cylindrical lenticules of width *w*;
means including a plurality M of projecting lenses for projecting a corresponding plurality M of two-dimensional views of an object field, a plurality $N \leqq M$ of which were taken from different vantage points relative to the object field, onto said lenticular screen with the projected image of a selected common element of each view in substantial registry with a reference point located substantially at the position of said lenticular screen, the number M of projected two-dimensional views being equal to w/m, where *m* is the width of an individual condensed image formed at the rear surface of a lenticule;
a corresponding plurality M of photographic recordings, each arranged in optical alignment with a corresponding one of said projecting lenses and containing a photographic image of one of said two-dimensional views; and
means for supporting said plurality M of projecting lenses and said corresponding plurality M of photographic recordings in a plurality of rows, said rows of projecting lenses and photographic recordings being spaced apart in the direction of the lengthwise extent of the lenticules and being offset relative to one another in the direction of the widthwise extent of the lenticules of said lenticular screen such that the apertures of said M lenses, when viewed in the direction of the lengthwise extent of the lenticules, are arranged substantially in edge-to-edge contiguous relation,
whereby said M projected two-dimensional views form M condensed images at the rear surface of each lenticule which are substantially contiguous and non-overlapping.

4,101,211
MAGNETIC CURTAIN SEAL FOR DEVELOPMENT APPARATUS

Walter Kayson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1976, Ser. No. 704,215
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD 1 Claim





1. In an electrographic development apparatus including a sump for receiving developer having toner and magnetic particles, and a development station having means for applying toner to an electrostatic image carried on an insulating surface, and at least one rotatable auger disposed in a passageway formed between the sump and the development station, the improvement comprising:

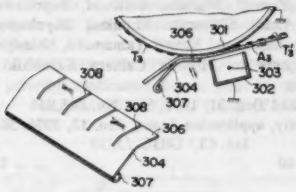
magnetic curtain seal means having a magnetic shunt member and a plurality of magnets connected to said shunt member, said magnetic curtain seal means being disposed relative to said auger and said passageway for attracting a portion of the developer to block a part of said passageway, whereby toner dust is prevented from escaping from said sump through such blocked portion of said passageway into said development station.

4,101,212
IMAGE TRANSFER COMPLEMENTARY APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Keiji Sumiyoshi, Hino, and Tomio Saitoh, Iruma, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1977, Ser. No. 759,373
Claims priority, application Japan, Jan. 19, 1976, 51-4013
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 TR 5 Claims

5. In an electrophotographic copying machine having means for providing a developed toner image on the surface of a recording element and means, having a discharge electrode, for electrostatically transferring, at a transfer zone, the developed toner image to a transfer sheet supplied to the transfer zone, the improvement comprising an image transfer complementary device including a depressing plate having an end portion extending adjacent the recording element, at least the end portion of said plate being adapted to press the transfer sheet, at a position upstream of the transfer zone, against the

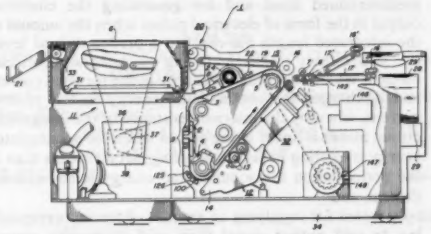


surface of the recording element and being deformable in response to movement of the transfer sheet.

4,101,213
ZOOM LENS COPIER

Kenneth W. Laskowski, Fairport, and Edward L. Steiner, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 577,379, May 14, 1975, Pat. No. 4,046,467.
This application Nov. 26, 1976, Ser. No. 745,254
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—5 5 Claims



1. In the method of producing copies electrostatically using a movable photoreceptor, the steps comprising:

(a) flash illuminating an original to be reproduced to produce a light image representative of said original;

(b) projecting said light image by means of an infinitely variable lens means onto the photoreceptor whereby to form a latent electrostatic image of the original on said photoreceptor for development and transfer to copy substrate material;

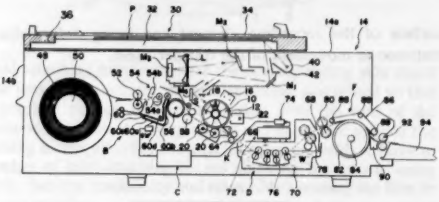
(c) changing actuation of said illuminating flash to displace the light image produced on said photoreceptor and the position of the developed image on said copy substrate material; and

(d) operating said lens means to adjust the size of the light image projected by said lens means onto the photoreceptor so as to produce a copy of the entire original without deletion of any information due to displacement of said image.

4,101,214
TONER DISPENSING DEVICE WITH ELECTRICAL INTEGRATING CIRCUIT

Yutaka Irie; Tomoji Murata, both of Toyokawa; Kenji Shibazaki, Aichi; Shigemitu Shimizu, Toyokawa; Yukio Tokura, Toyohashi, and Shunji Yamamoto, Shinshiro, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 31, 1975, Ser. No. 645,914
Claims priority, application Japan, Jan. 13, 1975, 50-7419[U]
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 12 Claims



1. A toner dispensing means for use in an electrophotographic copying apparatus having an optical system, means for forming an electrostatic latent image upon receipt of light rays projected through said optical system from an original to be copied, said electrostatic latent image corresponding to an image of the original which has been carried by said optical system, means for feeding copy material into contact with said latent image forming means, said toner dispensing means comprising:

toner storing means;

detecting means for detecting the length of copy material passing through the path means;

circuit means for electrically integrating the length of the copy material detected by said detecting means and for memorizing the integrated length of the copy material until the amount of the integrated length has reached a predetermined level and for generating the electrical output in the form of electrical pulses when the amount of the integrated length has reached a predetermined level, the said circuit means including an integrating circuit element which accumulates energy in the forward current and discharges the accumulated energy in the reverse current, whereby the internal resistance of the integrating circuit means is lower in the period when the accumulated energy is existing in said integrating circuit means than in the period when the accumulated energy is not existing therein; and

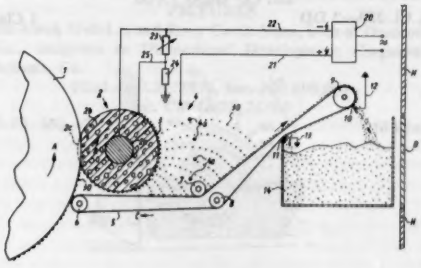
supply means for supplying an amount of toner corresponding to said output signal from said integrating circuit means to the developing means.

4,101,215
CLEANING DEVICE FOR AN ELECTROSTATIC COPIER

Günther Fottner, and Gottfried Waibel, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Dec. 15, 1976, Ser. No. 750,804
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557758
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 22 Claims

1. In an electrostatic copier wherein an electrostatic image pattern is formed on the photoconductive surface of a travelling endless carrier, toner particles are electrostatically attracted to said pattern to form a visible image and are thereupon transferred to an image carrier, and cleaning means subsequently cleans incremental portions of the photoconductive surface to remove residual toner particles therefrom which then become lodged on said cleaning means, the improvement comprising means for dislodging toner particles from said cleaning means; a receptacle spaced from said dislodging means; a grid-electrode intermediate said receptacle and said dislodging means and spaced from the latter, said grid-electrode being provided with a plurality of interstices so as to be

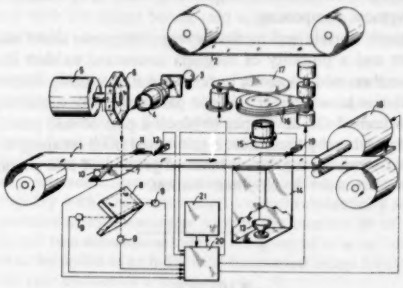


readily permeable to toner particles; and means connected to said grid-electrode for generating between the same and said dislodging means an electric field which impels dislodged particles from said dislodging means towards and through said grid-electrode for eventual deposition in said receptacle.

4,101,216
METHOD AND APPARATUS FOR PRINT EXPOSURE CONTROL

Walter Grossmann, Russikon, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Continuation-in-part of Ser. No. 637,103, Dec. 2, 1975, abandoned. This application Sep. 10, 1976, Ser. No. 722,115
Claims priority, application Switzerland, Dec. 13, 1974, 16612/74
Int. Cl.[2] G03B *27/76, 27/78*
U.S. Cl. 355—35 18 Claims



17. A photographic printer for producing photographic prints from an original, comprising

a means for scanning the density of the original point-by-point in three primary colours *i, j* and *k* and evaluating density values D_i, D_j, D_k of the three primary colours *i, j, k* in each point of scan of the original,

a process computer connected to said scanning means and programmed to

select from all density values evaluated in the scanning means only those which originate from points of scan the three density values of which satisfy at least two of the following three conditions:

$$D_i - \frac{aD_i+bD_j+cD_k}{a+b+c} \leqq D_{N_i} - \frac{aD_{N_i}+bD_{N_j}+cD_{Nk}}{a+b+c} \pm d_1$$

-continued

$$D_j - \frac{aD_i+bD_j+cD_k}{a+b+c} \leqq D_{N_j} - \frac{aD_{N_i}+bD_{N_j}+cD_{N_k}}{a+b+c} \pm d_2$$

$$D_k - \frac{aD_i+bD_j+cD_k}{a+b+c} \leqq D_{N_k} - \frac{aD_{N_i}+bD_{N_j}\pm cD_{N_k}}{a+b+c} \pm d_3$$

where D_i, D_j and D_k denote the densities of the scanned points for the primary colours *i, j* and *k; a, b* and *c* being constant factors, d_1, d_2 and d_3 being constant density values, and D_{N_i}, D_{N_j} and D_{N_k} denoting the densities of the primary colours *i, j,* and *k* of a reference original, and to determine area density values in the three primary colours *i, j, k* from the so selected density values; and

a means for exposing a light sensitive material to light from said original, said exposure means having a control means which controls exposure in accordance with said area density values.

4,101,217

AUTOMATIC COLOR PRINTING APPARATUS

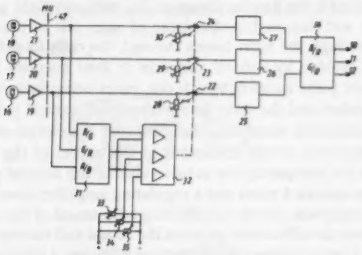
Berthold Fergg, Taufkirchen; Wolfgang Zahn, Munich, and Walter Knapp, Taufkirchen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,595

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1975, 2535034

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—38 **21 Claims**



1. In a photographic color printing apparatus wherein originals are imaged onto photosensitive receptors and at least some originals include areas of predominant color, an exposure control comprising signal transmitting photosensitive transducer means operative to scan the areas of an original in the primary colors; signal transmitting means for evaluating signals from said transducer means for the presence of areas of predominant color; signal transmitting means for integrating the signals from said transducer means in the primary colors; signal transmitting means for comparing signals from said evaluating means with reference signals; means for modifying the signals from said transducer means to said integerating means in response to signals transmitted by said comparing means and indicative of areas of predominant color, said modifying means comprising switching means operative to at least reduce the intensity of signals from said transducer means to said integrating means in response to signals transmitted by said comparing means on scanning of an area of predominant color; and means for regulating the exposure of a receptor in response to signals from said integrating means.

4,101,218

ELECTRONIC COPYING APPARATUS

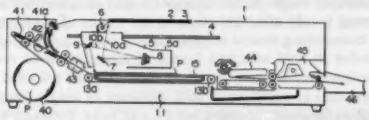
Ryoji Saruwatari, Niiza; Fumio Tamakawa, Yokohama; Takeo Ikeda, Yokohama, and Norio Misawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 23, 1977, Ser. No. 780,645

Claims priority, application Japan, Mar. 26, 1976, 51-33203

Int. Cl.[2] G03G *15/00*; G03B *27/34*

U.S. Cl. 355—57 **8 Claims**



1. An electronic copying apparatus comprising a copying machine body; original mount means for fixing an original to said body; support means for supporting a photosensitive body in parallel with said original; an optical unit provided in said machine body to move along said original and including a light source for irradiating said original and lens means defining a first light path between the original and the lens means and a second light path between the lens means and the photosensitive body, both said first and second light paths having a ratio of optical distances controlled according to the copying magnification; and driving means for stopping the photosensitive body to allow the optical unit to perform scanning in full-scale copying and in varied-scale copying, allowing the optical unit to perform scanning while moving the photosensitive body and the optical unit according to the correlation as follows

$$V_P = |V_L(1-\alpha)|$$

where V_P is a moving speed of the photosensitive body at time of exposure, V_L is a moving speed of the optical unit at time of exposure, V_L is a moving speed of optical unit at time of exposure, and α is a copying magnification.

4,101,219

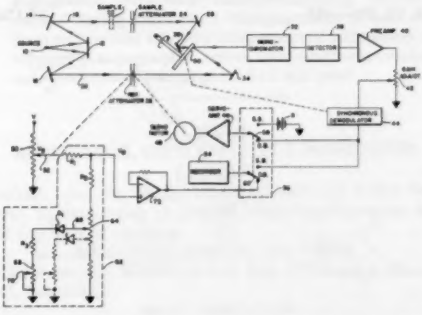
APPARATUS FOR CALIBRATING AN OPTICAL NULL SPECTROPHOTOMETER

Allan S. Way, Irvine, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 2, 1976, Ser. No. 702,252

Int. Cl.[2] G01J *3/42*; G01R *15/10*

U.S. Cl. 356—89 **2 Claims**



1. In a double beam optical null spectrophotometer including sample and reference optical beam paths, a radiation detector, an attenuator feedback loop connected to said detector for positioning an optical attenuator in the reference beam path in response to a detector signal indicative of an energy difference in the sample and reference beam paths to equalize the energy

in said beam paths, a transmitting potentiometer having a slider movable with said attenuator and providing a potentiometer output signal at said slider as a function of the position of said attenuator, a recorder, means for selectively connecting said slider to said recorder to record said potentiometer output signal and apparatus for calibrating said transmitting potentiometer including means for selectively disabling said attenuator feedback loop and means for coupling the output of said detector to said recorder while said attenuator feedback loop is disabled and while said slider is disconnected from said recorder and while blocking one of said beam paths to record a measure of single beam energy of said spectrophotometer for selected levels of attenuation in the other of said beam paths, said connecting means selectively connecting said slider to said recorder at said selected levels of attenuation to record said potentiometer output signal at each of said selected levels of attenuation in addition to said measure of single beam energy, the improvement comprising:

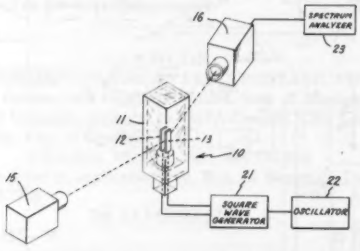
a signal level sensitive impedance network connected to said slider of said transmitting potentiometer for modifying said potentionmeter output signal to achieve a substantially linear relationship between said potentiometer output signal and said measure of said single beam energy over a range of levels of attenuation including said selected levels of attenuation, said signal level sensitive impedance network including a first electrical resistance network having a variable resistor, a second electrical resistance network, means coupling said second electrical resistance network between said slider of said transmitting potentiometer and a source of potential, switch means including a nonlinear circuit element, means connecting said nonlinear circuit element in series circuit with said variable resistor of said first electrical resistance network between an adjustable slider on said second electrical resistance network and a source of potential, said adjustable slider adjusting the switching characteristic of said nonlinear circuit element and said variable resistor cooperating with said nonlinear circuit element to establish the impedance of said series circuit for modifying said potentiometer output signal to achieve a substantially linear relationship between said potentiometer output signal and said measure of said single beam energy over said range of levels of attenuation.

4,101,220

LASER DOPPLER SPECTROSCOPY WITH SMOOTHENED SPECTRA LINE SHAPES

Charles P. Bean, and Egidijus E. Uzgiris, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,186
Int. Cl.² G01N *27/26*
U.S. Cl. 356—105 **10 Claims**



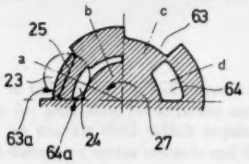
1. In the method of measuring electrophoretic mobility distribution of particles suspended in a fluid and situated in a square wave electric field by heterodyning laser light of a predetermined unshifted frequency with said laser light after undergoing a Doppler shift in frequency caused by said particles scattering laser light impinging thereon so as to produce a signal representative of said Doppler shift in frequency, the improvement comprising varying the electric field square wave frequency in a predetermined manner.

4,101,221

PROCESS FOR THE PHOTO-OPTICAL MEASUREMENT OF THE ABSORPTION BEHAVIOR OF SOLID, LIQUID AND GASEOUS MEDIA

Gunter Schunck, and Albert Randwo, both of Bruchkobel, Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Mar. 23, 1977, Ser. No. 780,400
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614181
Int. Cl.² G01N *21/22*
U.S. Cl. 356—205 **9 Claims**



2. In an apparatus for the photo-optical measurement of the absorption behavior of solid, liquid and gaseous media, of the type having an optical radiation source, a test cell, a standard absorption cell, chopper means for breaking up light beams passing through both cells into a periodic sequence of light pulses, at least one light receiver, and a circuit for the indication of the measured value and adjustable for compensating for changes in the radiating intensity of the optical radiation source and in the sensitivity of the light receiver, wherein the improvement comprises: the chopper means including at least one set of holes having alternatively different light admitting ability and disposed in the range of each cell to periodically pass through the light beams through the cells to define light pulses divided by defined variation of their intensity into two different pulse series of which one series comprises measuring light pulses and the other series comprises control pulses having a relatively short time duration, and the circuit comprises a comparison circuit connected to the output of the light receiver for comparing the actual value of the control pulses to a given standard value and a regulating amplifier controlled by the comparison circuit for effecting adjustment of the circuit to decrease the difference between the actual and standard values of the control pulses during the time duration, a phasing circuit synchronized by the control signals, and a plurality of circuits controlled by the phasing circuit for alternately periodically feeding the control pulses during each time duration to the comparison circuit and to the phasing circuit and feeding the measuring light pulses to be indicating after each time duration.

4,101,222

SPECTROPHOTOMETER SAMPLE HOLDER WITH IMPROVED SAMPLE VIEWING APPARATUS

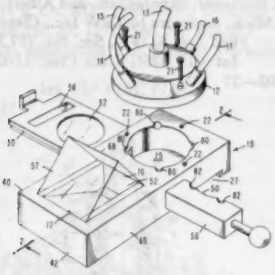
Einar Skau Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,769
Int. Cl.² G01N *21/16*; G01J *3/42*
U.S. Cl. 356—244 **7 Claims**

1. In a color analyzer of the type having a probe head, a base forming a cavity for the probe head, means for positioning a subject such as a textile to be analyzed adjacent to the base at the end of the cavity opposite the probe head for a color analyzing operation on the subject, means for supporting the base for a sample to be at approximately hand level and slightly

below eye level for a seated operator, improved apparatus for use by the operator for viewing the sample at the position at which the color analysis is to be made, comprising,

a shutter mechanism and means in said base for guiding said shutter mechanism along a path between an open position and a closed position, the path intersecting a portion of the cavity, said shutter having a surface conforming to the



shape of the cavity when the shutter is in the closed position,

means in said base forming an optical pathway between said cavity and an upper surface of the base when the shutter is in its open position, and

a prism mounted on said base over said pathway to provide an image of the textile to be analyzed at a convenient viewing height when the shutter is open.

4,101,223

ATTACHMENT MEMBER FOR EXCHANGEABLE LENSES

Shuzo Mutsushita, Ikeda, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Jul. 7, 1977, Ser. No. 813,657

Claims priority, application Japan, Jul. 12, 1976, 51-91649[U]

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—286 **34 Claims**

1. An attachment member adapted for use in conjunction with an exchangeable lens for a single lens reflex camera body where the exchangeable lens is of the type including a diaphragm setting ring manually rotatable for setting a desired diaphragm aperture and information transmitting means arranged on said diaphragm setting ring for transmitting to a camera body information as to the step-difference between a minimum *f*-number of the exchangeable lens and a set *f*-number corresponding to the diaphragm aperture set by said diaphragm setting ring when the exchangeable lens is mounted on a camera body.

said attachment member comprising:

a substantially circular body adapted to be releasably attached to the outer periphery of said exchangeable lens; and

an information transmitting means arranged on said substantially circular body at an angular position thereon dependent upon a maximum *f*-number of the particular exchangeable lens to be used therewith and adapted for transmitting to a camera body information as to be maximum *f*-number of the exchangeable lens when the substantially circular body is attached to the exchangeable lens at a predetermined angular position, and the exchangeable lens is in turn mounted on a camera body, whereby with the diaphragm setting ring of an exchangeable lens set to a minimum aperture corresponding to the maximum *f*-number, information as to the minimum *f*-number of the exchangeable lens may be obtained within a camera body when information thus transmitted by the information transmitting means of the lens and the attachment member to the camera body is combined.

4,101,224

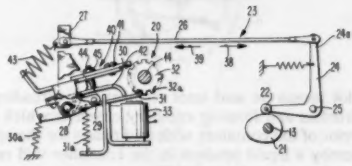
ESCAPEMENT MECHANISM FOR TYPEWRITERS

John Robert Litkenhus, Lawrenceburg, and Donald Wayne Stafford, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,129

Int. Cl.[2] B41J *19/20*

U.S. Cl. 400—328 **12 Claims**



1. In a typewriter having a cyclicly rotatable print shaft, a driven leadscrew having a ratchet thereon, said leadscrew connected to a carrier containing a typing element thereon, and a pawl for engagement with said ratchet and normally biased to inhibit motion of said leadscrew;

a cam mounted for rotation with said print shaft, a cam follower engaging said cam and means interconnecting said cam follower and said pawl whereby on rotation of said print shaft said cam effects momentary disengagement of said pawl from said ratchet to permit rotation of said leadscrew and movement of said carrier, and means selectvely operable for maintaining disengagement of said pawl from said ratchet a predetermined period of time; and

detent means carried by said interconnecting means for engagement with said ratchet inhibiting movement thereof during momentary disengagement of said pawl from said ratchet whereby escapement of said ratchet and leadscrew is prevented unless said selectively operable means maintains disengagement of said pawl.

4,101,225

APPLICATOR, ESPECIALLY FOR PIGMENTED LIQUIDS

Friedrich Linz, No. 97, D-8561 Hirschbach, and Lothar Sommer, Kurlandstrasse 24, D 8500 Nuremburg-Katzwang, both of Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,020

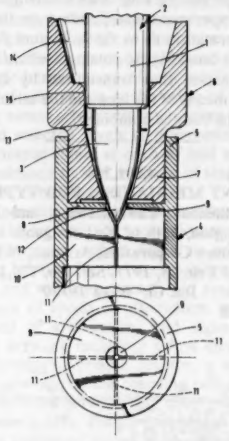
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 7540155[U]

Int. Cl.[2] A46B *11/00*

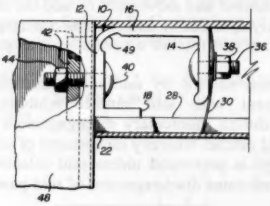
U.S. Cl. 401—119 **8 Claims**

1. An applicator for a liquid product, including a container open at one end; a handle adapted to be fitted on said open end of the container to close it; a shaft connected to said handle, an applicator tip at that end of said shaft which in a closed position of the applicator faces the container and adapted to

project into the container; means defining capillary channels in said applicator tip; means mounting said applicator on said shaft to project from the free end of said shaft; an inset element in the container at said open end thereof, means on said inset element defining an approximately central recess for accommodating said applicator tip in the closed position; and transverse slot means on said inset element and extending in the axial direction and forming capillary channels which connect the interior of the container with said recess for the applicator tip, whereby a liquid product in the container will enter said capillary channels and be guided into communication with said applicator tip.

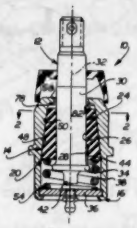


4,101,226
FENCE RAIL FASTENER
Rudolph E. Parisien, 891 Rainbow St., Ottawa, Canada
Filed May 24, 1977, Ser. No. 800,076
Claims priority, application Canada, May 31, 1976, 253756
Int. Cl.[2] F16B *2/02*
U.S. Cl. 403—4 **4 Claims**



1. A bracket for use in fastening a fence rail to a fence post so that the end of said rail abuts a side of said post, said rail and said post being in the form of channel members having spaced apart side walls and an interconnecting wall, said side walls being bent inwardly to define a slot therebetween, said bracket comprising a channel type member having two side walls and an interconnecting side wall, a first one of said side walls being bent toward a second one of said side walls so as to provide a partial wall substantially parallel to said connecting wall, adjustable attaching means on said first side wall for engaging said post and a curved sheet metal member, at least one major dimension of which is greater than an interior dimension of said rail, secured to said second side wall at an outer face thereof, whereby when said bracket is inserted into said rail so that said first wall thereof is adjacent but spaced from an end of said rail and said first wall is then secured to said post by said adjustable means in such a manner that movement of at least a cental portion of the sheet metal member causes said curved sheet metal member to flatten and consequently edges of said sheet metal member are wedged against inner walls of said rail.

4,101,227
PIVOT JOINT
Edward J. Herbenar, Birmingham, and Albert W. Gair, Fraser, both of Mich., assignors to TRW Inc., Cleveland, Ohio
Filed Jan. 6, 1977, Ser. No. 757,342
Int. Cl.[2] B25G *3/00*; F16C *11/00*
U.S. Cl. 403—27 **12 Claims**



1. A pivot joint assembly comprising housing means for at least partially defining a cavity, said housing means having open and closed end portions, an axially movable and rotatable stud extending axially through said open end portion of said housing means into said cavity, said stud having a head end portion disposed in said cavity and a cylindrical shank portion extending outwardly from said head end portion of said stud through said open end portion of said housing means, said stud being movable between a retracted position in which said shank portion extends a relatively small distance outwardly from said housing means and an extended position in which said shank portion extends a relatively large distance outwardly from said housing means, bearing means disposed in said cavity for preventing sidewise movement of said stud relative to said housing means during axial and rotational movement of said stud relative to said housing means, said bearing means including a cylindical bearing surface engaging the cylindrical shank portion of said stud and a circular end surface facing toward said closed end portion of said housing, said head end portion of said stud being disposed axially between said end surface of said bearing means and said closed end portion of said housing means, said head end portion of said stud having a first side surface which is disposed in abutting engagement with said circular end surface of said bearing means when said stud is in the extended position to limit axially outward movement of the shank portion of said stud, said head end portion of said stud having a second side surface which is disposed in abutting engagement with said closed end portion of said housing means when said stud is in the retracted position to limit axially inward movement of the shank portion of said stud, said first side surface being spaced apart from said bearing means when said stud is in the retracted position and said second side surface being spaced apart from said closed end portion of said housing means when said stud is in the extended position by a distance through which said stud is freely movable axially between the retracted and extended positions, and wear take-up means for pressing said cylindrical bearing surface firmly against the cylindrical shank portion of said stud during axial and rotational movement of said stud to enable said bearing means to hold said stud against sidewise movement after normal wear has occurred between said bearing surface means and the shank portion of said stud, said wear take-up means including spring means disposed between said bearing means and said closed end portion of said cavity for applying force to said bearing means to continuously urge said bearing surface into engagement with the shank portion of said stud during axial and rotational movement of said stud relative

to said housing means prior to the occurrence of excessive wear between said bearing surface and the shank portion of said stud.

4,101,228

HOUSING FOR A FLEXIBLE COUPLING

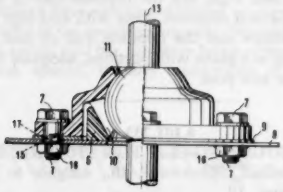
Wolfgang Scheerer, Meerbusch, Germany, assignor to A. Ehrenreich GmbH & Co. KG., Dusseldorf, Germany

Filed Jul. 25, 1977, Ser. No. 818,613

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2634938

Int. Cl.[2] F16C *11/00*

U.S. Cl. 403—137 **10 Claims**



1. A housing for use in connection with a flexible, substantially spherically-shaped coupling having a ball, particularly for a gear-shift lever in automobiles,

comprising in combination:

a hollow, generally spherically-shaped casing body adapted to engage the ball and having a central axis, a plurality of slits extending in a direction corresponding to longitudinal lines of a globe within a predetermined region of said casing body, and including an external portion in the shape of a truncated cone within the region of said slits,

a frame connected to said casing body, and

a cup-shaped body surronding the cone-shaped portion of said casing body and being axially adjustable with respect to said casing body, whereby when a generally axial pressure is exerted between said bodies, the extent of engagement between said casing body and the ball is adjusted.

4,101,229

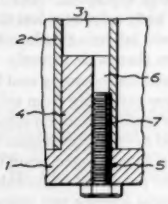
CONNECTION DEVICE

Torsten Waloddi Weibull, Torpamöllan, 270 44 Brösarp, Sweden

Claims priority, application Sweden, Feb. 19, 1976, 7601912

Int. Cl.[2] F16D *1/00*

U.S. Cl. 403—171 **5 Claims**



1. A connection device for connecting at least two frame members to each other, said connection device comprising:

a connection member formed of at least two plates interconnected at an angle;

a projection extending from at least one of said plates;

each of said frame members having at least one recess adapted to accommodate said projection, each of said plates having a through hole, said projection having a groove disposed in and along the periphery thereof, said hole in said plate and said groove being in axial alignment; and

a self-threading screw means extending freely through said hole in said plate and being adapted to partially reside in said groove, said groove being shaped and configured so that when said screw means is inserted through said hole and into said groove, said screw means, by rotation thereof, threads itself into the material of said frame member recess surrounding said projection adjacent said groove;

whereby said connection member is securely connected to at least one of said frame members.

4,101,230

JOINT FOR TRUSSES

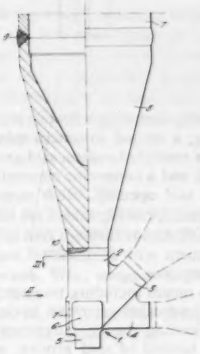
Per H. Moe, Kristian Brenners vei 56c, 3000 Drammen, Norway

Filed Mar. 18, 1976, Ser. No. 667,956

Claims priority, application Norway, Mar. 20, 1975, 750967

Int. Cl.[2] F16B *7/00*

U.S. Cl. 403—171 **5 Claims**



1. A joint structure for joining the ends of large-diameter tubular truss members, comprising:

a unitary joining member of solid construction, having protruding stub arms each adapted to be connected to one end of one of said truss members and each of a circumference small compared with that of said corresponding truss end;

said joining member being substantially homogeneous and having substantially isotropic ultimate strength characteristics, whereby the stress point at which it loses its integrity is substantially the same for all directions of applied stress; and

transition pieces each welded at one end to one of said stub arms and each weldable at its other end to the corresponding one of said truss members, for supportively connecting said stub arms to said truss members;

each of said transition pieces having a first portion of substantially solid construction in cross-section adjacent the stub arm to which it is welded, and each having a second portion toward its other remote end which is tubular to substantially match the said end of the corresponding truss member for easy welding thereto;

each of said transition pieces having an outer circumference which increases along the direction from said solid first portion thereof toward said tubular second portion thereof, and having a wall thickness in said tubular second portion which gradually decreases by tapering downwardly from a position adjacent said first portion thereof toward said other remote end thereof;

whereby there is provided a greater flexibility in and adjacent said stub arms than in said truss members, thereby providing a flexible connection for said truss members which is capable of relieving bending stresses in said truss members, while rendering more reliably calculable the

load-bearing characteristics of an assembly of truss members joined by said joint structure.

4,101,231

RELEASABLE ASSEMBLY OF STRUCTURAL MEMBERS

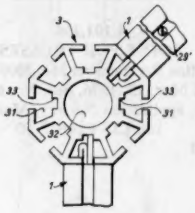
Albrecht Streib, Leinenweberstr. 67, 7000-Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,466

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616440

Int. Cl.[2] F16B *9/02*

U.S. Cl. 403—252 **10 Claims**



1. In an assembly including a first structural member formed with an opening; a second structural member formed with a groove having a restricted orifice, said groove and said orifice being elongated; and a connector element having a body portion secured in said opening, catch means mounted on said body portion, and operating means on said body portion for moving said catch means through said orifice into and out of locking engagement with said second member, the improvement which comprises:

(a) said catch means including two catch members,

(1) one of said catch members having an enlarged head portion leading during movement of said one catch member inward of said groove, and a reduced neck portion adjacent said head portion in trailing relationship; and

(b) said operating means including

(1) a single, manually operable drive member, and

(2) motion transmitting means connecting said drive member to said two catch members for moving the catch members inward and outward of said groove in timed sequence,

(3) said one catch member leading the other catch member during said moving.

4,101,232

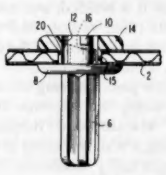
TIER SUPPORT SYSTEM FOR FANCY CAKES

Ray Haapala, Rte. 3, Box 76, Dassel, Minn. 55325

Division of Ser. No. 725,579, Sep. 22, 1976. This application Jul. 22, 1977, Ser. No. 818,071

Int. Cl.[2] F16B *9/02*

U.S. Cl. 403—261 **1 Claim**



1. A post having its entire length cross-sectioned so as to facilitate insertion into and removal from a cake with minimal distortion thereof with means for mounting the same in a panel aperture of predetermined size comprising:

a removable head member including a sleeve adapted to engage through the panel aperture and a collar on one end thereof larger than the panel aperture and having an underside spaced from the other end of the sleeve and extending outwardly from the sleeve, said sleeve having therein an opposed pair of cam ramps with circumferentially spaced ends defining therebetween an opposed pair of slots, a stud member on one end of said post, said stud member having on an outer end thereof an opposed pair of lugs adapted to engage through the opposed pair of slots between the cam ramps, and a second collar larger than the panel aperture and spaced along the length of said stud from said lugs, the length of the sleeve between the underside of the first collar being such that the end of the sleeve engages against the second collar and said outer end of said stud, said lugs, and the exposed end of the sleeve collar all lie in a common plane with said lugs seated on the cam ramps and the opposite end of said post also terminating in a plane with portions, adequate to provide support for said post.

4,101,233

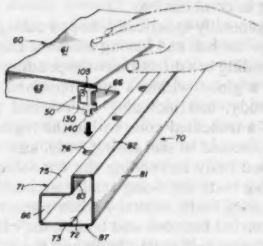
PANEL MOUNTING CLIP FOR STORAGE RACK

Kennedy McConnell, Homewood, Ill., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Mar. 25, 1977, Ser. No. 781,168

Int. Cl.[2] B25G *3/36*

U.S. Cl. 403—397 **14 Claims**



1. A clip for securing a deck panel having openings therein adjacent to the ends thereof to an apertured beam in a storage rack to maintain the positional relationship of the panel and the beam during material loading and unloading, said clip comprising a generally flat body, a recurved flange carried by said body adjacent to the periphery thereof and extending therefrom in a first direction in overlapping spaced-apart relationship with a portion of said body, a tab extending from said body toward said flange and spaced therefrom in a direction perpendicular to said body a distance less than the thickness of an associated panel, said tab being deflectable away from said flange for cooperation therewith securely to hold the associated panel therebetween for mounting said body on the associated panel, and a finger extending from said body beyond the periphery thereof in a second direction substantially normal to said first direction, and having engagement means for insertion through an aperture in an associated beam to engage the beam thereby to maintain the positional relationship of the panel and the beam during material loading and unloading.

4,101,234

SHOPPING CART THEFT-CONTROL APPARATUS

Ernesto G. Castaneda, 7934 Lou Dillon, Los Angeles, Calif. 90001

Filed Apr. 18, 1977, Ser. No. 788,618

Int. Cl.[2] E01F *13/00*

U.S. Cl. 404—6 **1 Claim**

1. A shopping cart theft-control apparatus wherein said cart is prevented from being removed from a restricted area sur-

rounding a shopping facility, wherein said apparatus comprises:

a peripheral wall structure defining said restricted area;

a plurality of driveway entrances arranged to allow egress and ingress for various sizes of vehicles;

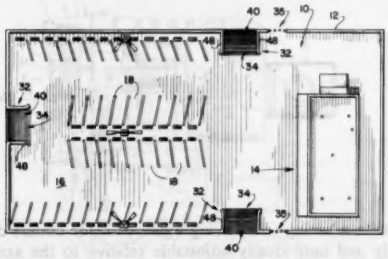
a plurality of pedestrian portals formed in said peripheral wall structure;

means provided within said pedestrian portal to prevent said cart from passing therethrough, said means comprising a plurality of vertical post members equally spaced apart wherein the width of the spaces therebetween prevents carts from passing therethrough, yet it is wide enough to allow pedestrian traffic therethrough;

means disposed in said driveway entrance for preventing said cart from traversing said driveway entrance, wherein said means comprises:

a stationary base structure defining an apron,

a plurality of bar members laterally disposed and affixed in said apron, said bar members being arranged in a juxtaposed, spaced, parallel relationship to one another,



wherein said bar members comprise an elongated channel member affixed in said apron having a pair of side walls and a top surface wall substantially spaced above the surface of said apron.

restraining wells defined by spaces formed between each of said bar members, said wells being adapted to receive various sizes of caster wheels associated with said carts, whereby said wheels are locked within said restraining wells by engaging respective bar members forming said wells, wherein the width of said wells is between 4 to 4½ inches and wherein the depth thereof is between 1 to ½ inch,

a boundary barrier comprising a pair of oppositely disposed and inwardly extending wall structures formed from said peripheral wall structure, wherein each extending wall structure is disposed along the terminating ends of said bar members; and

wherein said resricted area thereof comprises a vehicle parking lot, whereby said shopping carts are freely movable therein to allow said carts to be transported without restriction to the parked vehicles.

4,101,235

PARKING LOT EXIT CONTROL MEANS

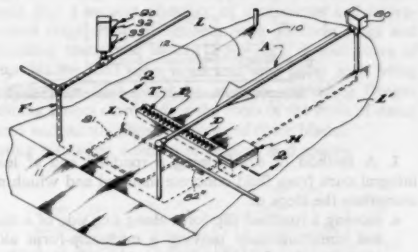
Donald F. Nelson, 14756 Burbank Blvd., Van Nuys, Calif. 91411

Filed Jun. 27, 1977, Ser. No. 810,174

Int. Cl.[2] E01F *13/00*

U.S. Cl. 404—6 **10 Claims**

1. Traffic control means to control the movement of automobiles into and out of defined areas, the traffic control means including an elongate lane with inlet and outlet ends and a top surface, said lane having one end opening into said area and its other end opening outside said area, an elongate barrier in and extending transverse the lane between the ends thereof, said barrier including an elongate rotatable shaft positioned below the surface of the lane, in a normal rotative position a plurality of tire piercing spikes secured to the shaft in longitudinally spaced relationship and normally projecting upwardly therefrom and upwardly from the surface of the lane; electric powered operating means at one end of the shaft to rotate the shaft to and from an actuated position where said spikes project horizontally therefrom and occur below said surface, and control means to cause the operating means to sequentially rotate the shaft from its normal to its actuated position and from its actuated position to its normal position and including



a control circuit with a primary actuating switching means at the upstream end of the lane and connected in the circuit to cause the operating means to rotate the shaft from its normal to its actuated position and a secondary actuating switching means in the outlet end portion of the lane and connected in the circuit to cause the operating means to rotate the shaft from its actuated to its normal position.

4,101,236

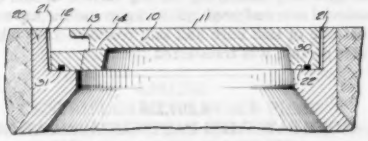
SEALING MANHOLE COVER FOR USE ON EXISTING UNSEALED SANITARY SEWER MANHOLE COVER FRAMES

Jack M. Meyer, Neenah, Wis., assignor to Neenah Foundry Company, Neenah, Wis.

Filed Jun. 29, 1977, Ser. No. 811,019

Int. Cl.[2] E02D *29/14*

U.S. Cl. 404—25 **4 Claims**



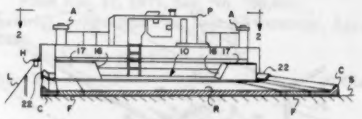
1. A manhole cover for reception in a conventional manhole cover frame having a horizontal flange extending peripherally around an opening, said manhole cover having a horizontal peripheral portion adapted to rest on said ledge, the novelty comprising, an imperforate upper surface of said cover extending entirely across the cover broken only by a blind pocket to receive a manhole opening tool, and an O-ring groove extending around the lower surface of said horizontal peripheral portion of said cover at a location such that when the cover is installed in a standard manhole cover frame the O-ring groove will be located over the horizontal flange of a said frame, said groove being downward opening and rectangular in radial cross section, and spaced inwardly from the periphery of said cover, and an O-ring having a generally circular radial cross section with a diameter sufficiently greater than the radial width of said groove that said O-ring must be compressed slightly to place it in the groove, said groove having a vertical depth slightly more than half the diameter of the O-ring whereby the O-ring is retained in said groove by compression of its diameter and has a portion projecting downwardly from the groove whereby to engage the flange of a said manhole cover frame when said manhole cover is installed in a said frame.

4,101,237

METHOD OF SLIP-FORMING ROADBEDS AND APPARATUS THEREFOR

Gerald Anthony Catenacci, 44 Golfvalley La., Toronto, Canada

Filed Aug. 16, 1977, Ser. No. 825,129
Int. Cl.² E01C *11/28*
U.S. Cl. 404—98 **16 Claims**



1. A method of slip-forming a roadbed and at least one integral curb from fluid concrete material and which method comprises the steps of:

a. moving a roadbed slip-form along one side of a trackway and simultaneously moving a curb slip-form along an opposite side of said trackway, said roadbed slip-form and said curb slip-form being mutually spaced apart by a distance equalling at least the width of said trackway;

b. continuously depositing concrete material in front of both said roadbed slip-form and said curb slip-form whereby movement of said slip-forms over said concrete material will shape and form said concrete material into a roadbed and a curb, said roadbed and said curb so formed being mutually spaced apart by a predetermined gap;

c. continuously passing a filler portion of concrete material through one of said roadbed slip-form and said curb slip-form, said filler portion of concrete material being disposed on the top surface of concrete material formed by a respective one of said slip-forms and being located generally along one edge of and on one of said roadbed and said curb adjacent said gap;

d. continuously transferring said filler portion of concrete material transversely into said gap thereby filling said gap to join said curb and said roadbed to form a single integral homogeneous concrete structure; and

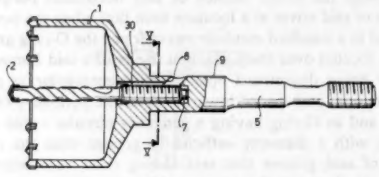
e. continuously smoothing the top surface of said concrete material as transferred into said gap and the top surface of that one of said curb and said roadbed from which said filler portion was transferred.

4,101,238

HOLE SAW WITH PARTICLE-ASPIRATING ACCESSORY FOR HAND DRILL

Wilbert Reibetanz, Leinfelden; Karl Wanner, Echterdingen, and Klaus Voss, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 10, 1977, Ser. No. 757,853
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602238
Int. Cl.² B23B *27/10, 41/02*
U.S. Cl. 408—59 **10 Claims**



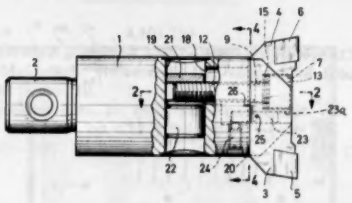
1. A drill accessory comprising a cup centered on a rotation axis and having a rim centered on said axis, said cup having a shaft adapted to be received in a drill chuck and extending along said axis from said cup away from said rim, said cup being formed with a bore lying on said axis and opening into said cup, said shaft being formed with a first passage extending non-axially from said bore to the outer surface of said shaft; a second passage communicating between the cup interior and said first passage; at least one tooth on said rim, whereby rotation of said cup and shaft about said axis with said rim pressed against a workpiece will cause said tooth to cut an annular groove centered on said axis in said workpiece; and a pilot bit lying on said axis and having a shank removably received in said bore and a tip projecting axially beyond said rim.

4,101,239

BORING TOOL PROVIDED WITH A PAIR OF SEPARATELY ADJUSTABLE CUTTERS

Gerhard Wohlhaupter, Frickenhausen, Fed. Rep. of Germany, assignor to Emil Wohlhaupter u. Co., Frickenhausen, Wurtt, Fed. Rep. of Germany

Filed Jun. 6, 1977, Ser. No. 803,427
Int. Cl.² B23B *29/034*
U.S. Cl. 408—182 **8 Claims**



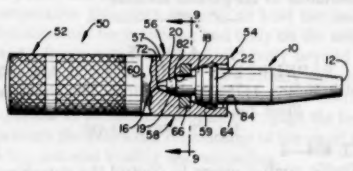
1. In a boring tool having a pair of blade cutters diametrically and individually adjustable relative to the axis of the boring tool, wherein means are provided for slidably mounting said blade cutters on the end of the body of said boring tool and for guiding said blade cutters to permit displacement thereof along an appropriate diameter, the improvement comprising a recess formed in said body having an axis parallel to the direction of displacement of said blade cutters, a mounting screw for each blade cutter, slots in said body for accepting said mounting screws, each of said slots having an axis at an angle to the longitudinal axis of said body and the end of each of said mounting screws engaging a separate retainer slidably disposed in said recess.

4,101,240

NOZZLE REFACING TOOL

Ray D. Fox, 1912 W. 28th St., Odessa, Tex. 79763

Filed Apr. 4, 1977, Ser. No. 784,443
Int. Cl.² B23B *51/00, 3/22*; B27F *1/08*
U.S. Cl. 408—211 **14 Claims**



1. A refacing tool by which spaced seating surfaces of an oxygen-acetylene torch nozzle can be refaced, comprising:

a main body by which said tool can be manipulated;

a plurality of support members having opposed ends with one of said opposed ends being affixed to said main body and the other of said opposed ends extending therefrom and in radially spaced relation to one another;

said radially spaced support members each having a cutting

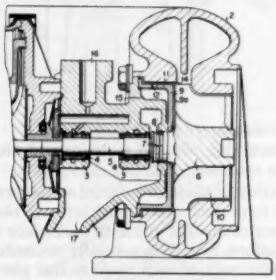
face formed thereon for simultaneously engaging the spaced seating surfaces of the nozzle;

a guide member affixed to the free ends of said support members for telescopingly receiving a marginal length of the torch nozzle therewithin with spaced marginal lengths of said cutting face being brought into engagement with the spaced seating surfaces of the nozzle, whereupon the refacing tool can be axially rotated respective to the longitudinal axis of the nozzle to cause the cutting face to remove material from and thus reface the spaced seating surfaces.

4,101,241
SUPER CHARGER WITH FLUID BIASED HEAT SHROUD

Tamotsu Kasuya, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 19, 1976, Ser. No. 687,905
Int. Cl.[2] F01D *5/08, 25/08*
U.S. Cl. 415—113 **3 Claims**



1. A supercharger, comprising:

a center housing having an inlet and an outlet for a lubricant;

a turbine casing mounted on said center housing;

a turbine shaft rotatably supported within said center housing, said turbine shaft having a turbine impeller at one end thereof within said turbine casing;

sealing means provided on said turbine shaft to prevent lubricant leakage from said center housing to said turbine casing;

a heat shroud mounted on said turbine shaft between said center housing and said turbine casing; and

pressure means provided on said heat shroud which permits communication of the inside and outside thereof thereby applying the pressure on the outside of said heat shroud to the inside of said heat shroud whereby the pressure on the inside of said heat shroud is greater than the pressure in said center housing thereby enhancing the sealing effect of said sealing means.

4,101,242
MATCHING THERMAL EXPANSION OF COMPONENTS OF TURBO-MACHINES

John Frederick Coplin, Duffield; Anthony Butler, Belper, and Peter Frederick Neal, Donington, all of England, assignors to Rolls-Royce Limited, Derby, England

Filed Jun. 2, 1976, Ser. No. 692,051
Claims priority, application United Kingdom, Jun. 20, 1975, 26427/75
Int. Cl.[2] F01D *1/04, 5/08, 25/08, 25/26*
U.S. Cl. 415—134 **8 Claims**

1. An axial flow compressor for a gas turbine engine comprising:

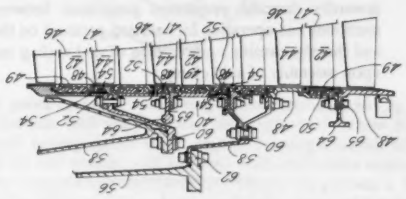
a bladed rotor including a plurality of axially spaced rows of rotor blades;

a casing surrounding said bladed rotor;

a plurality of axially spaced rows of stator vanes disposed between the rows of rotor blades, said rows of stator vanes having roots supported by said casing;

said casing having an inner wall and a radially spaced outer wall at locations surrounding the rows of stator vanes and surrounding at least one row of rotor blades; said inner wall including a first plurality of continuous and unsegmented platform rings with each one of said platform rings extending about and supporting a row of stator vanes and a second plurality of continuous and unsegmented rings disposed between said platform rings and extending about and spaced from each of said rows of rotor blades, said inner wall and said outer wall being spaced from each other by radially extending flanges defining spaces surrounding the roots of the rows of stator vanes and surrounding the rows of rotor blades;

a heating insulating medium in each of said spaces;



a lining of heating insulating material on a radially inner surface of each of said second plurality of rings at a location of said rows of rotor blades;

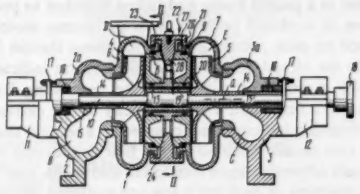
a rigid mass spaced radially outwardly of and extending around said casing, said mass being relatively cool with respect to said casing and having a lower rate of thermal expansion than a rate of thermal expansion of said casing; and

means rigidly connecting said mass to said casing whereby said inner wall of said casing as defined by said first and second plurality of rings are restrained in their expansion and prevented from getting out of round by said rigid mass so that at least said second plurality of rings have a rate of expansion substantially equal to a rate of expansion of said bladed rotor.

4,101,243
CENTRIFUGAL TWO-STAGE PUMP

Viktor Arsentievich Tatkov; Petr Ipatovich Jurin; Gennady Ivanovich Bondarev, and Mikhail Andreevich Koryagin, all of Novokuznetsk Kemerovskoi oblasti, U.S.S.R., assignors to Vsesohuzny nauchno-issledovatelsku I Proktno-Konstruk torsky institut. Dobychi Uglya Grdravlicheskin Sposobom "Vnilgidrougal", Novokuznetsk Kemerovskoi oblasti, U.S.S.R.

Filed Feb. 24, 1976, Ser. No. 661,047
Claims priority, application U.S.S.R., Feb. 28, 1975, 2106103
Int. Cl.[2] F01D *25/24*
U.S. Cl. 415—201 **6 Claims**



1. A two-stage centrifugal pump comprising:

(a) a hollow, elongated casing having a longitudinal axis and including a pair of axially spaced sections each of which comprises a plurality of releasably connected parts so that

said casing is dismountable, said sections having confronting flanges provided with recesses;

(b) a pair of axially spaced partitions respectively cooperating with said sections in the regions of said flanges to define a pair of chambers interiorly of said casing;

(c) sealing members between said casing and said partitions for sealing said chambers;

(d) a shaft in said casing mounted for rotation on said axis;

(e) a pair of impellers mounted on said shaft for rotation therewith and each arranged in one of said chambers; and

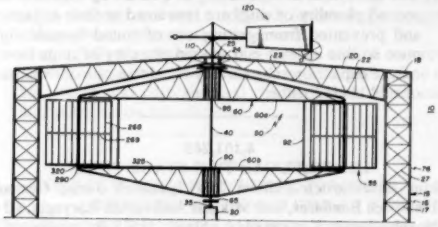
(f) a clamp for connecting said sections arranged between the latter, said clamp including a pair of releasably connected portions joined along a plane which substantially passes through said axis so as to permit rapid disassembly of said pump, and said clamp being provided with collars which are received in said recesses, said clamp having an inwardly directed projection positioned between said partitions and operative for exerting pressure on the latter and thereby causing compression of said sealing members upon assembly of said clamp.

4,101,244

VERTICAL AXLE PADDLE MOTOR

Robert B. Grotberg, Kathryn, N. Dak. 58089

Filed Nov. 5, 1976, Ser. No. 739,263
Int. Cl.[2] F03D 7/06
U.S. Cl. 416—41 **23 Claims**



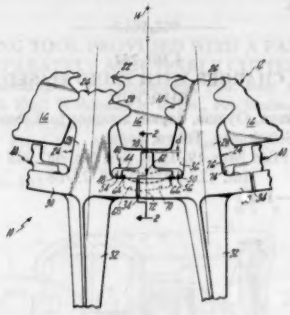
1. A vertical axis paddle motor comprising, an upstanding frame, a vertical axle supported by said frame, a rotor frame having a plurality of rotor arms journaled on said vertical axle for rotation on said axle and within said upstanding frame, a paddle pivotally mounted on the end of each rotor arm, each of said paddles being formed of a plurality of vanes pivotally mounted in a paddle frame and linked together to pivot from an open to a closed position with the frame, motor means mounted on each paddle to move the vanes therein from the open to the closed position, a wind direction indicator vane pivotally mounted on the top of the upstanding frame and coupled to a first shaft, a wind velocity sensor carried by the wind direction indicator and coupled to a second shaft, composite cam means mounted on the first and second shaft and separately adjustable upon rotation of said shafts, cam follower means mounted on each rotor arm and engaging the composite cam means, means connecting the cam follower means to the motor means mounted on the paddle for each arm to control the operation of the motor means in the opening and closing of the vanes, and means connected to the vertical axle and driven thereby.

4,101,245

INTERBLADE DAMPER AND SEAL FOR TURBOMACHINERY ROTOR

John R. Hess, Westchester, Ohio, and Herbert Frederick Asplund, South Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,666
Int. Cl.[2] F01D 5/26
U.S. Cl. 416—190 **13 Claims**



1. A turbomachinery rotor comprising:

(A) a central disc adapted to be rotated about an axis of rotation extending axially of the rotor,

(B) a plurality of blades connected to the periphery of said disc to form a circumferential array of blades about the periphery of the disc and with each blade having,

(1) a platform extending generally circumferentially from opposite sides of each blade so that platforms of adjacent blades terminate in close circumferential proximity to define a circumferential gap of selected size between adjacent blade platforms and so that the disc and adjacent blades and their platforms cooperate to define a blade damper cavity therebetween communicating with said gap, and

(a) each platform including a flat surface adjacent the blade and generally facing the disc axis and extending for substantially the full axial dimension of the cavity to define a part of said cavity and positioned so that the blade platform flat surfaces of adjacent blades in each cavity are parallel and lie in the same plane, which plane is perpendicular to a radial line extending from said axis of rotation and passing midway between said flat surfaces in each cavity and

(b) a recessed portion extending for substantially the full axial dimension of the blade damper cavity and opening thereinto and into the platform circumferential gap so that said recessed portions of adjacent platforms cooperate to define a continuous recess extending substantially for the full axial dimension of the damper cavity and opening thereinto,

(C) a one-piece blade damper and seal located in said blade damper cavity and extending for substantially the full axial dimension thereof and overlapping said flat surfaces of adjacent blade platforms and having,

(1) rails of curved cross-section extending in parallel relationship for the full axial dimension of the damper on opposite lateral sides thereof so that said rails contact adjacent platform single plane, flat surfaces in line contact for substantially the full axial dimension of the cavity,

(2) a solid central portion of the blade damper extending between said rails and across said gap and outwardly into the blade platform recess so that the blade damper center of gravity is located on or near said platform flat surfaces so that, in response to centrifugal force, the blade damper rails bear in line contact against adjacent

blade platform single plane, flat surfaces for substantially the full axial dimension of the blade damper cavity to cooperate with the central portion to seal said cavity from said gap to thereby prevent recirculation of hot gases through said gap and around said damper into said blade damper cavity, and so that as each blade platform moves circumferentially during rotor operation, the line contact between the damper rail and the platform flat surface will establish friction therebetween to dampen blade motion.

4,101,246

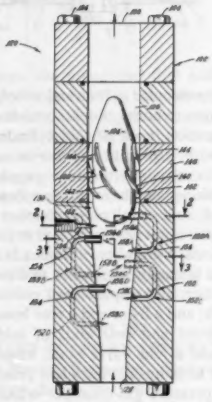
VORTEX JET PUMP

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Huntington Park, Calif.

Continuation-in-part of Ser. No. 527,219, Nov. 26, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,861

Int. Cl.[2] F04F *5/10, 5/42, 5/46*

U.S. Cl. 417—171 **11 Claims**



1. A fluid jet pump comprising:

a pumped fluid suction inlet;

a fluid outlet downstream from the suction inlet;

a fluid flow passage between the suction inlet and the outlet;

a power liquid jet inlet for injecting power liquid into the fluid flow passage in a generally tangential direction;

a throat in the fluid flow passage downstream from the power liquid jet inlet having a flow cross section less than the flow cross section of the passage adjacent the power liquid jet inlet;

a diffuser section in the fluid flow passage downstream from the throat and including means for converting primarily circumferential fluid flow to primarily axial fluid flow in the passage;

means upstream from the power liquid jet inlet for initiating a component of circumferential flow in fluid in the passage in the same sense as the tangential direction of the power liquid jet inlet, comprising:

means for extracting a portion of fluid from the fluid flow passage downstream from the power liquid jet inlet; and

means for injecting the portion of fluid into the fluid flow passage, upstream from the power liquid jet inlet at least partly tangentially and with a lower velocity head than power liquid injected through the power fluid jet inlet; and

means upstream from the power liquid jet inlet for injecting fluid into the passage in a primarily tangential direction with the velocity head of the injected fluid being less than the velocity head of the power liquid injected through the jet inlet.

4,101,247

GETTER DEVICE WITH IMPROVED SUPPORT MEMBER

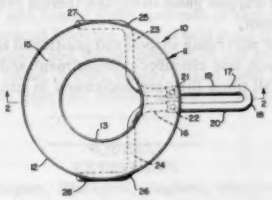
Franco Pirota; Nello Violini, and Mario Zucchinelli, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Apr. 20, 1977, Ser. No. 789,291

Claims priority, application Italy, May 12, 1976, 23184 A/76

Int. Cl.[2] F04B *37/02*

U.S. Cl. 417—48 **6 Claims**



1. A getter assembly comprising a getter container having at least one side wall and a bottom wall connected to said side wall and having getter metal vapour relesing material supported by said bottom wall and side wall, and a wire support member comprising a substantially U-shaped tab portion in the form of an arcuate portion and two slightly distanced substantially parallel arms the arcuate portion of which extends radially outwards in a plane parallel to the plane of the bottom wall to a distance greater than the outer radius of the getter assembly, at least one arm of said tab portion being attached to said bottom wall the ends of each arm opposite the arcuate portion being joined to secondary support elements which secondary support elements increase their separation along their length until said separation is approximately equal to the outer diameter of the getter assembly, each support element terminating at the beginning of one of a pair of similar runners of arcuate configuration individually having a length approximately equal to the outer radius of the getter assembly and extending substantially parallel to one another and substantially parallel to the arms of the tab portion, the concave surface of the runners facing said bottom wall.

4,101,248

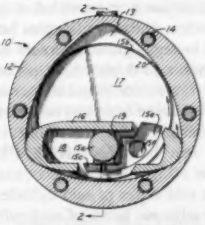
ROTARY GAS EXPANSION MOTOR

Earl William Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Filed Apr. 18, 1977, Ser. No. 788,516

Int. Cl.[2] F04B *23/10;* **F01C** *1/02, 21/14*

U.S. Cl. 417—204 **6 Claims**



1. A rotary gas expansion motor comprising:

a generally triangular chamber,

an elongate rotor,

said rotor being rotatable end over end inside said chamber and serving to divide same into two compartments,

a shaft with crank,

said crank extending into a slot in said rotor and serving to divide said slot into two cells,

a disk,

said disk being coaxially affixed to said shaft adjacent said chamber and said rotor,

said disk including an inlet port and an outlet port,

said inlet port being shaped and positioned to begin communication with each said chamber compartment and each said slot cell when they begin to increase in size and to continue said communication for less than a full movement of said rotor in said chamber and said crank in said slot, so as to provide early cut off in inlet gas and thus require trapped gases to expand therein prior to departing said motor,

said outlet port being shaped and positioned to communicate with each said chamber compartment and each said slot cell at all times they are decreasing in size.

4,101,249

SWASH PLATE TYPE COMPRESSOR

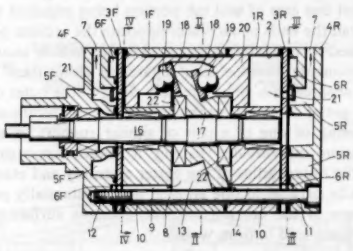
Shozo Nakayama, Kariya; Masayuki Kurahashi, Nagoya, and Mitsuhiro Hattori, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 29, 1976, Ser. No. 755,447

Claims priority, application Japan, Dec. 29, 1975, 50/155992

Int. Cl.[2] F04B *1/12, 27/08*

U.S. Cl. 417—269 **5 Claims**



1. A substantially circular cylindrical swash plate type compressor comprising a cylinder block consisting of a front portion and a rear portion, each of said cylinder block portions being provided with a plurality of bores arranged at equal distances along its circumference; a swash plate chamber formed in said cylinder block in which a swash plate is rotatably fixed to a shaft, said swash plate chamber being connected to a refrigerant gas suction port provided at the middle portion of said cylinder block; a plurality of duplex head pistons which axially reciprocate in engagement with said swash plate in said swash plate chamber, said duplex head pistons being fitted in said bores of said cylinder block; and a front and a rear housing respectively attached to the front and rear ends of said cylinder block through a front and a rear valve plate, respectively, each of said front and rear housings having a low pressure gas chamber as well as a high pressure gas chamber which may communicate with said bores of said cylinder block; wherein between each two adjacent bores of said cylinder block there is provided a through hole into which a clamping bolt is inserted, each through hole, for the length thereof, being greater in size than the diameter of said clamping bolt and providing a full length space which serves as a low pressure refrigerant gas passage parallel to said bores and in communication with the low pressure gas chamber of each of the front and rear housing; said refrigerant gas suction port, each refrigerant gas passage and said low pressure gas chambers of both housings being communicated with one another via said centrally located swash plate chamber.

4,101,250

SWASH PLATE TYPE COMPRESSOR

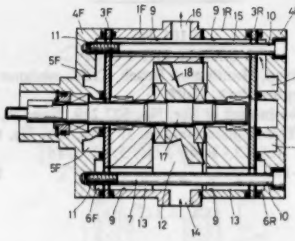
Shozo Nakayama, Kariya; Masayuki Kurahashi, Nagoya, and Nobuyuki Araki, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 29, 1976, Ser. No. 755,480

Claims priority, application Japan, Dec. 29, 1975, 50-176446[U]

Int. Cl.[2] F04B *1/12, 27/08*

U.S. Cl. 417—269 **5 Claims**



1. A substantially circular cylindrical swash plate type compressor comprising a cylinder block consisting of a front portion and a rear portion, each of said cylinder block portions being provided with a plurality of bores arranged at equal distances along its circumference; a swash plate chamber formed in said cylinder block in which a swash plate is rotatably fixed to a shaft, said swash plate chamber being connected to a refrigerant gas suction port provided at the middle portion of said cylinder block; a plurality of duplex head pistons which axially reciprocate in engagement with said swash plate in said swash plate chamber, said duplex head pistons being fitted in said cylinder block; and a front and a rear housing respectively attached to the front and rear ends of said cylinder block through a front and a rear valve plate, respectively, each of said front and rear housings having a low pressure gas chamber as well as a high pressure gas chamber which may communicate with said bores of said cylinder block; wherein between each two circumferentially adjacent bores of said cylinder block there is provided a through hole into which a clamping bolt is inserted, each through hole, for the length thereof, being greater in size than the diameter of said clamping bolt and providing a full length space which serves as a refrigerant gas passage parallel to said bores, a refrigerant gas outlet port provided at the middle portion of said cylinder block, at least one of said through holes being fluidly connected with said front and rear high pressure gas chambers formed in said front and rear housings and the refrigerant gas outlet port, and the other through holes being fluidly connected with said centrally located swash plate chamber and said low pressure gas chambers of both housings.

4,101,251

HYDRAULIC CONDUIT HAVING PIVOTING AND TELESCOPING CAPABILITY

Arthur D. Gay, Decatur; Derald L. Hartley, Mount Zion, and William H. Klekamp, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

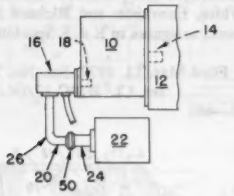
Filed Mar. 29, 1976, Ser. No. 671,651

Int. Cl.[2] F04B *39/14*

U.S. Cl. 417—313 **7 Claims**

4. Coupling apparatus comprising: a first conduit defining an inner cylindrical surface; a second conduit extending within the first conduit and defining a protruding surface portion thereabout in close proximity to the inner cylindrical surface of the first conduit; the first and second conduits being in telescoping inward and outward relation, with the protruding surface portion in close proximity to the inner cylindrical surface of the first conduit; and the protuding surface portion

being shaped to allow for a degree of misalignment of the second conduit relative to the first conduit; wherein the second conduit is pivotable relative to the first conduit generally about the longitudinal axis of a portion of the first conduit surrounding the second conduit; and further comprising a hydraulic tank secured to the first conduit, and a hydraulic pump secured to the second conduit, the first and second conduits providing communication between the tank and pump; the apparatus further comprising transmission means, the pump being releasably securable to the transmission means, and drivingly connected thereto through spline means when so secured to the



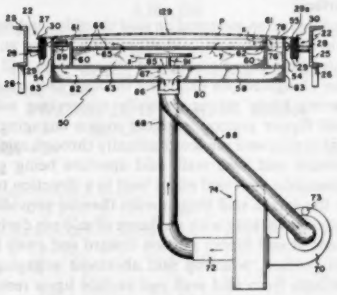
transmission means, the pump and first and second conduits being relatively positioned so that the spline means are substantially parallel to the telescoping movement allowed between the first and second conduits, so that outward telescoping movement of the second conduit relative to the first conduit provides for disengagement of the spline means, the second conduit being configured so that upon pivoting of the second conduit relative to the first conduit generally about the longitudinal axis of the portion of the first conduit surrounding the second conduit, the pump secured to the second conduit is moved laterally of the transmission means.

4,101,252

SHEET SUPPORT APPARATUS

Gaylord William Brown, Beaverton, Mich., assignor to Sweetheart Plastic, Inc., Beaverton, Mich.

Filed May 14, 1976, Ser. No. 686,301
Int. Cl.² B29C *17/00*
U.S. Cl. 425—394 **11 Claims**



1. Differential pressure thermoforming apparatus for forming articles in a continuous sheet of thermoplastic material comprising:

a frame having a longitudinally forward end and a rearward end;

laterally spaced apart sheet supporting means movably mounted on said frame for supporting the lateral edges of said sheet and for incrementally longitudinally forwardly indexing said continuous sheet of thermoplastic material relative to said frame in a forward, longitudinal path of travel;

mold means mounted on said frame (disposed) in juxtaposition with said sheet supporting means for forming articles in the sheet supported thereon;

said mold means being movable forward and away from said sheet between a retract position and a sheet engaging position;

heating means, disposed on said frame upstream of said mold means for heating said sheet to forming temperature; and

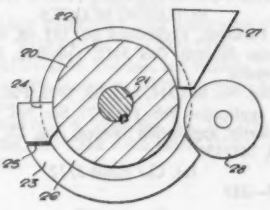
means, stationarily mounted on said frame upstream of said mold means, for upwardly directing pressurized fluid between said sheet supporting means to support the midportion of said heated sheet upstream of said mold means at a level spaced from the level of said mold means in said retract position and inhibit sagging of the midportion of said sheet under its own weight as said sheet moves relative thereto from said heating means to said mold means.

4,101,253

EXTRUSION

Clifford Etherington, Blackpool, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 671,031, Mar. 29, 1976, abandoned, which is a continuation of Ser. No. 541,089, Jan. 15, 1975, abandoned, which is a division of Ser. No. 388,139, Aug. 14, 1973, abandoned. This application Dec. 10, 1976, Ser. No. 749,444
Claims priority, application United Kingdom, Nov. 15, 1972, 52830/72; Jan. 9, 1973, 2968/73
Int. Cl.² B22F *3/18*
U.S. Cl. 425—79 **4 Claims**



1. Extrusion apparatus comprising a wheel member having an endless groove therein, a shoe member covering part of the length of the groove and forming a passageway therewith, an abutment member projecting into the groove and blocking one end of the passageway, the wheel member being rotatable relative to the shoe member in the direction towards the abutment member, at least one die orifice at least near the abutment member, and means for feeding loose feed material to be extruded into the end of the passageway remote from the abutment member so that the material is carried along in the groove by frictional drag in the direction towards the abutment member and is thereby extruded through the die orifice, and in which a rotary driven compacting member is arranged closely adjacent said shoe at said end of the passageway remote from the abutment to cooperate with the groove in the wheel member to form a nip for compacting the loose feed material into a continuous strip prior to entering the passageway, and means for driving said driven member.

4,101,254

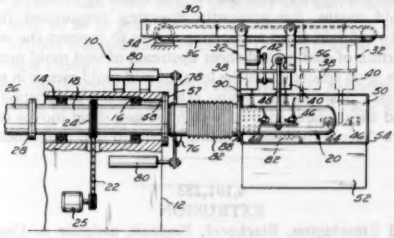
PREFORM MACHINE

Arthur J. Wiltshire, Richmond Heights, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio

Filed May 27, 1977, Ser. No. 801,145
Int. Cl.² B29J *5/00*
U.S. Cl. 425—82.1 **16 Claims**

1. A method of manufacturing a preform for fiber-reinforced, plastic articles, comprising the steps of rotating about its longitudinal axis an elongated, cylindrical, hollow tube having a cylindrical sidewall and a closed end and having perforations in its entire outer surface including said end,

blocking the perforations in at least a major portion of said cylindrical sidewall, applying vacuum to the inside of said form to draw air through unblocked perforations in said end, while said vacuum is applied, directing a large number of randomly oriented, short pieces of fiber against the outside surface of said end by a source of fibers, progressively unblocking the perforations and as the perforations are unblocked uniformly traversing the length of said form with said source, spraying said fibers with a thermosetting resin to bind said fibers together to form a preform without filling the voids between said fibers, and curing said resin while said preform remains on said form.



4,101,255

APPARATUS FOR MANUFACTURING WAVE-SHAPE BUILDING BLOCKS

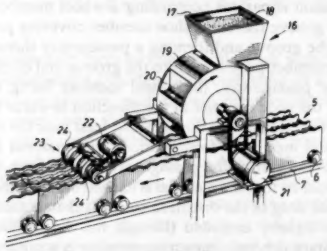
Sven Evert Fernaeus, Frejavägen 80, 191 46, Sollentuna, and Erik Anselm Jonsson, Box 3411, Yokelsbo, 820 40, Järvso, both of Sweden

Division of Ser. No. 605,314, Aug. 18, 1975, Pat. No. 4,040,226. This application Feb. 17, 1977, Ser. No. 769,430

Claims priority, application Sweden, Aug. 23, 1974, 7410741; Sep. 3, 1974, 7411139

Int. Cl.² B28B *3/12*

U.S. Cl. 425—219 **14 Claims**



1. Apparatus for manufacturing building blocks having a given wave-shape in two mutually transverse directions of the blocks, comprising:

at least one mold, the bottom surfaces of said mold having a shape corresponding to the wave-shape of the bottom of said blocks and the upper edge surfaces of the walls defining the longitudinal sidewalls of the mold having a wave-shaped upper edge profile corresponding to the wave-shape of the top of said blocks in the longitudinal direction of said blocks;

means located above said mold and operatively associated with said mold for supplying a casting mass to said at least one mold; and

a rotary and vertically movable roll above said mold and operatively associated with said mold for levelling out and smoothing the mass at the upper end of said at least one mold, said roll being movable relative to said at least one mold in the longitudinal direction of said mold and including means for cooperating with said wave-shaped upper edge profile of said longitudinal sidewalls of said at least one mold and being further vertically movable relative to said at least one mold in accordance with said wave-shaped upper edge profile, said roll having a profile corresponding to the desired wave-shape of said block in the transverse direction of said mold relative to the longitudinal direction thereof.

4,101,256

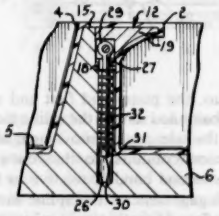
MOLD FOR FORMING A PLASTIC ARTICLE HAVING AN UNDERCUT OR NEGATIVE DRAFT PORTION

Roger L. White, Lawrence, and Richard K. Dalton, Garnett, both of Kans., assignors to E & E Specialties, Inc., Lawrence, Kans.

Filed Mar. 11, 1977, Ser. No. 776,701

Int. Cl.² B29C *17/04*

U.S. Cl. 425—441 **2 Claims**



1. A mold for forming articles having undercut or negative draft portions and comprising:

(a) a vacuum forming mold having a base wall and an upstanding wall member including an abutment surface, a wall end surface, and a shoulder having an elongated recess therein, thereby defining a mold cavity;

(b) an undercut defining mold member positioned on and projecting outwardly from said upstanding wall member for forming a hollow projection in an article formed from a plastic sheet, said undercut defining mold member comprising:

(1) a projecting flipper portion having an abutment engaging surface, a sill engaging surface, and a sheet engaging surface;

(2) a sill portion mounted on said shoulder and underlying said flipper portion, said sill portion having an aperture extending therethrough and aligned with said recess;

(3) an elongated pin extended through said aperture and having hinge means pivotally connecting said pin to said flipper portion, resilient means engaging said pin and urging said pin longitudinally through said aperture toward said base wall, said aperture being greater in dimension than said pin at least in a direction transverse to the axis of said hinge means thereby providing clearance for rocking with guidance of said pin during movement of said flipper portion toward and away from said sill portion, whereby said abutment engaging surface deflects from said wall end surface upon removal of a formed article, and automatically returns said flipper portion into engagement with said sill portion.

4,101,257

PILOT GAS CONSERVATION SYSTEM FOR FLARE STACKS

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

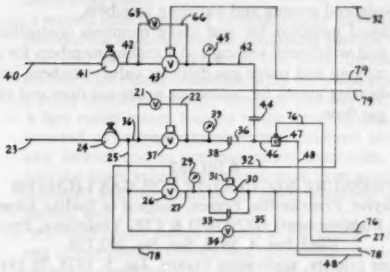
Filed Jun. 16, 1977, Ser. No. 807,198

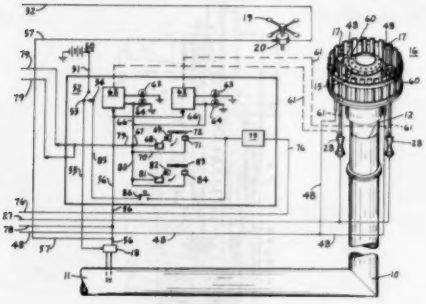
Int. Cl.² F23D *13/20*

U.S. Cl. 431—15 **10 Claims**

1. A control system for the pilot gas for a waste combustible gas flare burner having a pilot burner which comprises;

a waste combustible gas flare burner,
a connection to a supply of pilot gas,
a pilot burner for said flare burner connected to said supply connection igniting means for said pilot burner,





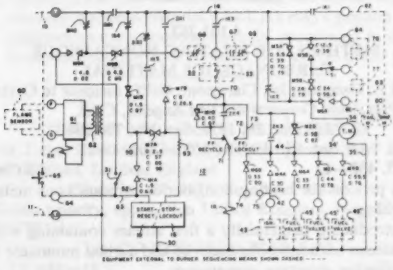
control means for controlling the supply of pilot gas to said pilot burner comprising a wind speed responsive member contiguous to the flare gas burner and a pilot gas control valve means,
control means for said igniting means comprising a member responsive to operation of said pilot burner.

4,101,258

FUEL BURNER SEQUENCING DEVICE WITH SAFETY CHECKING MEANS

Roelof F. Jacobsz, Blaine, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 25, 1977, Ser. No. 800,244
Int. Cl.[2] F23Q *23/00*
U.S. Cl. 431—26 **10 Claims**



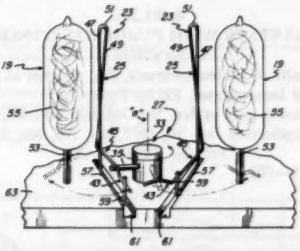
1. A fuel burner sequencing means for controlling a fuel burner in response to a controller and which includes safety checking means, including: programmed switch means and relay operated switch means; flame sensor and amplifier means controlling a portion of said relay operated switch means in response to a flame at said burner; said burner sequencing means responsive to said controller to provide a normal fuel burner initiation and ignition cycle to establish a flame at said burner with said flame monitored by said flame sensor and amplifier means; and said sequencing means including alternate action safety checking means which includes contact means with a first contact open circuited when a second contact is close circuited; said contact means connected to supply power to said sequencing means in conjunction with said programmed switch means and said relay operated switch means; said safety checking means operating in response to the operation of said controller to power said sequencing means and at the termination of the operation of said sequencing means to reset itself for the next cycle of said sequencing means; said safety checking means operating after said normal burner initiation to immediately stop said sequencing means and turn off fuel to said burner in the event said flame sensor and amplifier means indicates the presence of flame when none should be present, or if flame sensor and amplifier means indicates the absence of flame when a flame should be present.

4,101,259

MULTILAMP PHOTOFLASH ASSEMBLY WITH ROTATABLE ACTUATOR

John W. Shaffer; David W. Mecone, and William T. Colville, all of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 9, 1976, Ser. No. 740,279
Int. Cl.[2] F21K *5/02;* **G03B** *15/02*
U.S. Cl. 431—93 **26 Claims**

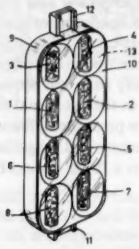


1. A multilamp photoflash assembly comprising:
an elongated housing defining first and second adjacently oriented regions therein;
a plurality of percussively ignitable flashlamps located within said first region of said housing;
a plurality of pre-energized striking mechanisms positioned within said first region of said housing, each of said striking mechanisms associated with one of said flashlamps for firing said flashlamps upon actuation thereof;
an elongated actuating member rotatably positioned within said housing, said actuating member having an end portion and a rodlike portion adjoining said end portion and passing through said first and second regions, said rodlike portion including a plurality of arm members spacedly positioned therealong and extending within said first region for actuating said pre-energized striking mechanisms in a sequential manner during rotation of said actuating member within said housing.

4,101,260
FLASH ARRAY

Markus Wilhelm Matthijs Wanninkhof; Johnny Wilhelmus van der Velden, and Pieter Hendrik Broerse, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,721
Claims priority, application Netherlands, Sep. 15, 1975, 7510808
Int. Cl.² F21K *5/02*
U.S. Cl. 431—95 R **3 Claims**

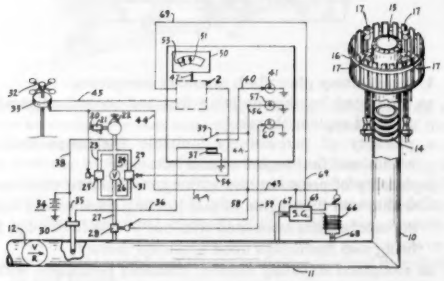


1. A flash array which comprises: a housing, a plurality of combustion flash lamps carried by said housing, electrical terminals connected to said lamps, said housing including at least one wall which includes a transluscent electrically conductive layers substantially all light radiating from the flash array passing through said transluscent electrically conductive layer and wall, said translucent electrically conductive layer being electrically connected to one of said terminals of the lamps, each of said plurality of lamps being a high voltage combustion flash lamp and the transparent electrically conductive layer having a resistance per square which is smaller than 50 kOhm and said transparent electrically conductive layer mainly consisting of conductive indium oxide.

4,101,261
FLARE GAS STACK WITH PURGE GAS CONSERVATION SYSTEM

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Continuation-in-part of Ser. No. 769,709, Feb. 17, 1977. This application Jun. 20, 1977, Ser. No. 808,287
Int. Cl.² F23D *13/20*
U.S. Cl. 431—202 **12 Claims**

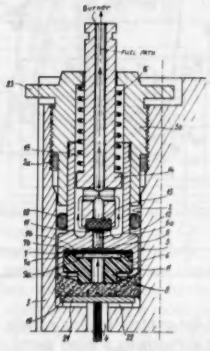


1. Control apparatus for a flare gas stack which comprises, in combination with a flare gas stack
a connection to said stack from a supply of waste combustible gas for combustion at the discharge end of the stack,
a connection to said stack from a supply of purge gas, and waste gas flow sensing and signaling members,
means for controlling the supply of purge gas to said stack, said means including
a valve member for controlling purge gas delivery from said supply,
members responsive to non-flow of waste gas for permitting purge gas flow,
windspeed sensing and signaling members,
control members for said valve members controlled by said windspeed sensing and signaling members for controlling said purge gas delivery valve members, and
indicating means for indicating waste gas flow and purge gas flow.

4,101,262
PRESSURE REGULATOR FOR GAS LIGHTER

Guy Neyret, Francheville, France, assignor to Société Anonyme dite: Etablissements GENOUD & CIE, Venissieux, France

Filed Jun. 4, 1976, Ser. No. 692,729
Claims priority, application France, Jun. 5, 1975, 75 18161
Int. Cl.² F23D *13/04*
U.S. Cl. 431—344 **15 Claims**



1. A pressure regulator for a gas lighter containing a reservoir of a gasifiable liquid fuel, said pressure regulator comprising a porous membrane of constant natural porosity and good wettability for hydrocarbons constituting a filter for controlling the maximum flame height of said lighter, means defining on one side of said filter a wetting chamber communicating with said reservoir, means defining on the other side of said filter an evaporation chamber communicating with a burner outlet, said filter having porosity characteristics determined at the time of its manufacture to establish a maximum height for said flame, at least one fiber layer disposed along a side of said membrane, and means independent of said membrane and compressible to vary the flame height.

4,101,263
METHOD FOR HEATING NONGASEOUS CARBONACEOUS MATERIAL

Robert E. Lumpkin, Jr., Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,006
Int. Cl.² F27D *13/00*; C10B *49/12*
U.S. Cl. 432—13 **23 Claims**

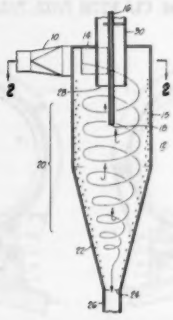
1. A process for heating nongaseous carbonaceous material comprising:
a. introducing tangentially a first stream containing a nongaseous carbonaceous material and carbon monoxide into a reactor structure comprising:
i. a reactor having a covered cylindrical chamber,
ii. a conical portion attached to said covered cylindrical chamber opposite the covered end thereof and in communication therewith,
iii. a first inlet means for directing a first stream containing

a nongaseous carbonaceous material tangentially into said covered cylindrical chamber and for causing nongaseous material to form an outer spiralling vortex which is urged towards said conical portion and for causing nongaseous material to be substantially separated from gases,

iv. a second inlet means for simultaneously and separately introducing a second stream containing gaseous oxygen into said reactor away from the walls thereof, said second inlet means communicating with said reactor at a point removed from the covered end thereof,

v. a first outlet means located in the covered end of said covered cylindrical chamber, and oriented along the axis thereof and in communication therewith, for removing gases substantially separated from nongaseous material, and for forming an inner spiralling gaseous vortex, and

vi. a second outlet means located at the smaller diameter end of said conical portion and in communication therewith for removing nongaseous material;



b. forming an outer spiralling vortex within said reactor to cause substantial separation of gases from said nongaseous carbonaceous material;

c. simultaneously and separately introducing a second stream containing oxygen into said reactor through said second inlet means and internally of said outer spiralling vortex, and reacting said oxygen with said first stream thereby producing a gaseous product comprising carbon dioxide and producing a heated nongaseous carbonaceous material;

d. removing a third stream from said reactor, through said first outlet means, containing said gaseous product which is substantially free of said nongaseous carbonaceous material before a major portion of said gaseous product comprising carbon dioxide can react with said nongaseous carbonaceous material; and

e. removing a fourth stream containing said heated nongaseous carbonaceous material which is a major portion of said nongaseous carbonaceous material introduced in step (a) from said reaction zone through said second outlet means.

4,101,264

DRYING APPARATUS AND METHOD

Derek Julian Barr, London, England, assignor to Barr & Murphy Limited, London, England

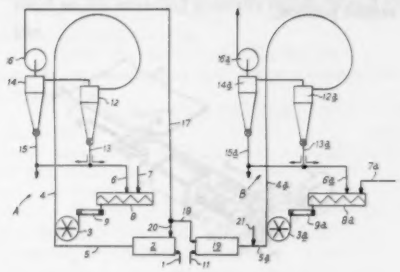
Filed Nov. 22, 1976, Ser. No. 744,041

Claims priority, application United Kingdom, Nov. 20, 1975, 47886/75

Int. Cl.[2] F27B *15/00*; F26B *3/10*

U.S. Cl. 432—14 **7 Claims**

1. A method of pneumatically drying two wet materials, the first of which produces an odorous exhaust during drying and the second of which products substantially no odorous exhaust during drying, using a first dryer section, a second dryer section, a furnace and an incinerator, which method comprises drying said first wet material in the first dryer section by means of a first stream of hot gas, re-cycling a portion of spent gas, including entrained moisture and odorous matter, from the first dryer section through the furnace and re-heating said portion of spent gas in the furnace by blowing into said portion of spent gas a flow of air in which fuel is burnt, thereby forming the first



stream of hot gas, passing the entire remaining portion of the spent gas, including entrained moisture and odorous matter, through the incinerator to pyrolyse the odorous matter in said remaining portion, and passing hot gaseous products from the incinerator through said second wet material in the second dryer section and then into the atmosphere.

4,101,265

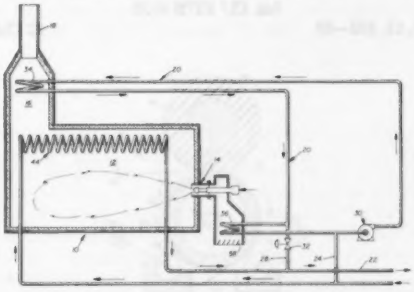
EQUIPMENT AND PROCESS INVOLVING COMBUSTION AND AIR

George C. Broach, and Donald W. Thurman, both of Tulsa, Okla., assignors to The G. C. Broach Company, Tulsa, Okla.

Filed Dec. 9, 1976, Ser. No. 748,885

Int. Cl.[2] F27B *5/16*

U.S. Cl. 432—29 **18 Claims**



1. In a system which includes a furnace for heating a fluid stream, the method of preheating combustion air being supplied to the system which comprises the steps of:

circulating a portion of fluid from said fluid stream first in non-contact heat exchange relationship with the products of combustion of said furnace, then

circulating said portion of fluid in non-contact heat exchange relationship with said combustion air.

4,101,266

FIRE PREVENTION DEVICE FOR THE FIXING STAGE OF AN ELECTROPHOTOGRAPHIC MACHINE

Keiichi Ishikawa, Urawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 14, 1977, Ser. No. 759,552

Int. Cl.[2] H05B *3/00*; G03G *8/00*; F27B *9/14*

U.S. Cl. 432—46 **11 Claims**

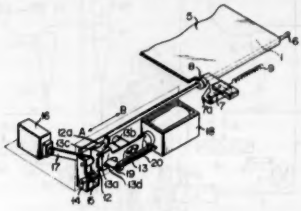
11. A fire prevention device for a fixing stage of an electro-

photographic copying machine, having an abnormality detection mechanism comprising:

a heat shield plate movable between a first position to close the front face of the fixing stage and a second position to open said front face;

heat shield plate transporting means to move said shield plate to said first position;

first locking means for holding said heat shield plate at said second position;



second locking means for holding said first locking means; and

a control means for operating said first and second locking means to bring the shield plate to the first position, when driving power for the copying machine is stopped during a copying operation, and to maintain the shield plate at the second position when driving power is stopped when the copying machine is in a ready condition but a copying operation has not been initiated.

4,101,267

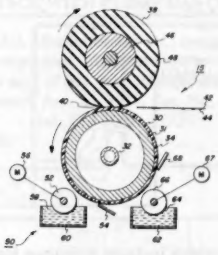
ROLL FUSER CLEANING SYSTEM

Karl J. Mueller, Fairport; Dewey H. Haumann, Jr., Palmyra, and Alvin D. Kromm, Jr., Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 621,991

Int. Cl.[2] F27B *9/28*

U.S. Cl. 432—60 **12 Claims**



1. Roll fuser apparatus including a heated fuser roll cooperating with a resilient backup roll for forming a nip through which support material having toner images adhered thereto moves with said toner images contacting said heated fuser roll to thereby soften the toner forming said toner images, said apparatus comprising:

a first means containing a quantity of first release fluid;

an applicator member, said applicator member being spaced from said heated fuser roll whereby there is no contact between the surfaces of said cleaning member and said heated fuser roll;

means for effecting movement of said applicator member through said first release fluid, said movement being effective to coat the surface of said applicator member to a thickness sufficient to transfer release fluid from said applicator member to said heated fuser roll;

a doctor blade cleaning member engaging the surface of said heated fuser roll for removing substantially all the release fluid from the heated fuser roll and any contaminants deposited thereon;

second means containing a quantity of second release fluid;

means for applying a coat of said second release fluid to said heated fuser roll subsequent to the functioning of said cleaning member, said second release fluid applying means serving to apply said release fluid in a thickness substantially less than the thickness initially applied for cleaning of said heated fuser roll whereby said last mentioned coating enhances release of support material from said heated fuser roll.

4,101,268

ROTARY KILN WITH PLANETARY COOLER

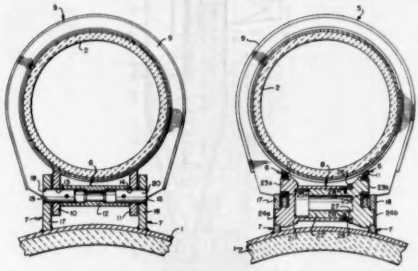
Karl Groiss, Linkoping, Sweden, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 16, 1976, Ser. No. 742,235

Claims priority, application United Kingdom, Nov. 17, 1975, 47244/75

Int. Cl.[2] F27B *7/02, 7/38*

U.S. Cl. 432—80 **28 Claims**



1. A rotary kiln having a planetary cooler system mounted for rotation therewith, said cooler system including at least one cooler tube having a forward portion and a rearward portion, said forward portion including an inlet end portion communicating with the rotary kiln for reception of material to be cooled, said rearward portion including an outlet end portion for exiting the cooled material, means to support each cooler tube in planetary fashion about said rotary kiln including first support means positioned adjacent said inlet end portion of said cooler tube and second support means positioned adjacent said outlet end portion of said cooler tube so as to retain the longitudinal axis of the cooler tube substantially parallel to the axis of rotation of the rotary kiln, at least said second support means comprising:

(a) an annular member disposed about said cooler tube;

(b) first mounting means having at least a first pair of generally parallel flanges mounted to said annular member, each flange defining at least one bore extending generally transverse to the axis of said cooler tube and disposed generally between said cooler tube and the rotary kiln;

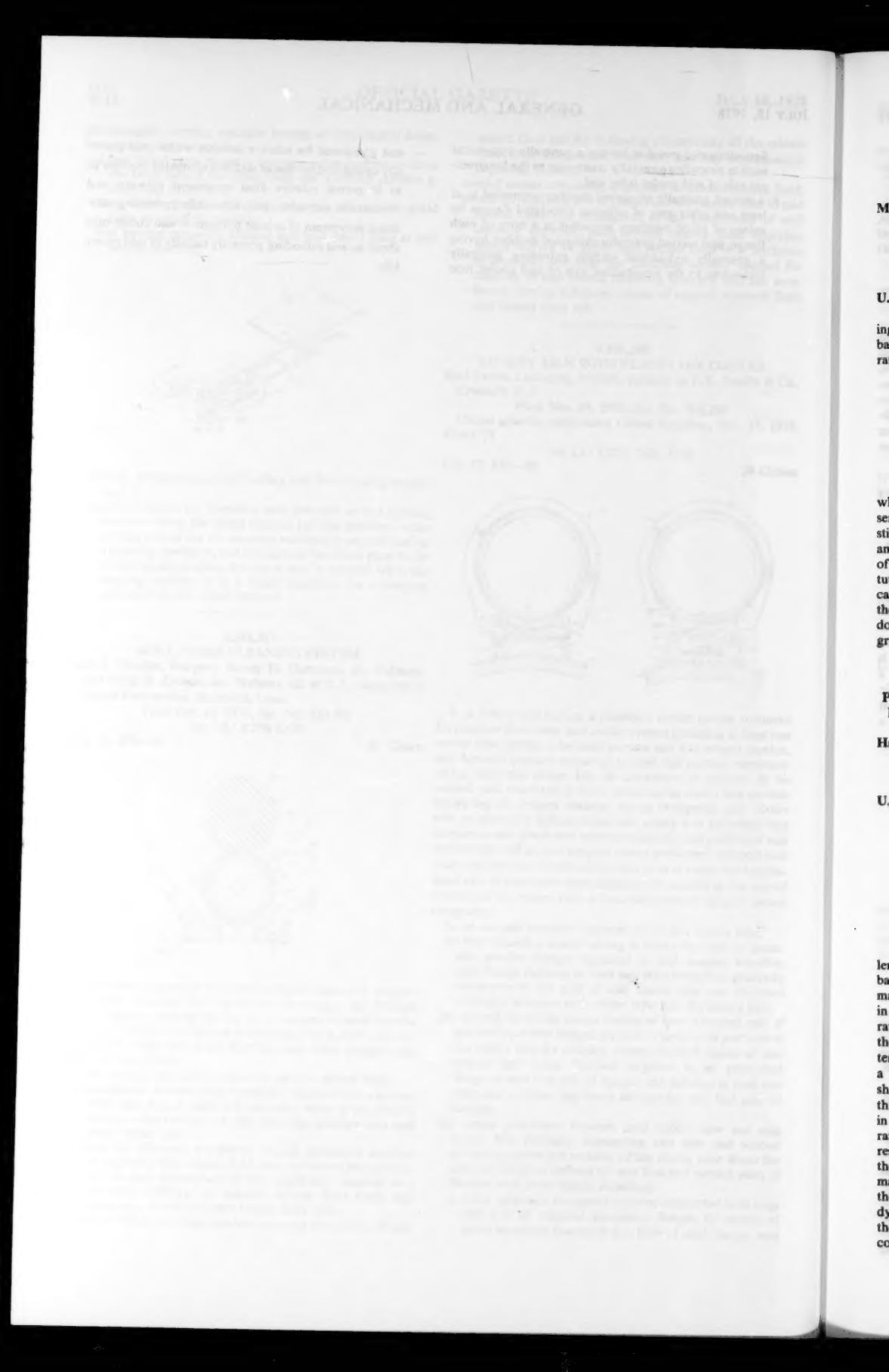
(c) second mounting means having at least a second pair of generally parallel flanges secured to peripheral portions of the rotary kiln for rotation therewith, each flange of said second pair being disposed adjacent to an associated flange of said first pair of flanges and defining at least one bore spaced from the bores defined by said first pair of flanges;

(d) means positioned between said cooler tube and said rotary kiln pivotally connecting said first and second mounting means for rotation of the cooler tube about the axes of the bores defined by said first and second pairs of flanges, said pivot means including:

i. a first generally elongated member connected to at least one pair of adjacent associated flanges by means of pivot members journaled in a bore of each flange, said

first elongated member having a generally cylindrical section extending generally transverse to the longitudinal axis of said cooler tube; and

ii. a second generally elongated member connected to at least one other pair of adjacent associated flanges by means of pivot members journaled in a bore of each flange, said second generally elongated member having a generally cylindrical section extending generally transverse to the longitudinal axis of said cooler tube and positioned for relative rotation within said generally cylindrical section of said first elongated member so as to permit relative axial movement between said cooler tube and said rotary kiln while permitting rotational movement of at least portions of said cooler tube about an axis extending generally radially of said rotary kiln.

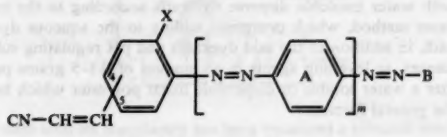


4,101,269
DYED POLYMERS AND COPOLYMERS HAVING A CYANOVINYL-AZO DYE INCORPORATED IN THE STRUCTURE THEREOF

Michel Maurice Luce Champenois, Le Mesnil Esnard, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 24, 1977, Ser. No. 761,570
Claims priority, application France, Aug. 2, 1974, 74 26847
Int. Cl.[2] D06P *3/00, 5/00*
U.S. Cl. 8—4 **17 Claims**

1. Structurally dyed random polymer or copolymer resulting from the radical polymerization of one or more colorless base monomers having a polymerizable olefinically unsaturated group and one or more dyes of the formula:

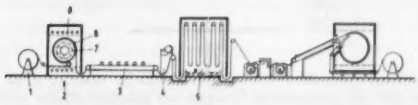


wherein —CH=CH—CN is fixed in position 4 or 5, X represents a hydrogen or halogen atom, the benzene ring A is unsubstituted or substituted by halogen atoms, alkyl, alkoxy or acylamino groups, m represents 0 or 1, and B represents the residue of a coupling component BH either substituted or unsubstituted, said coupling component being free of sulfonic and carboxylic acid groups, said polymerization taking place across the double bond of the cyanovinyl group of the dye and the double bond of the polymerizable olefinically unsaturated group of the base monomers.

4,101,270
PROCESS AND APPARATUS FOR THE CONTINUOUS DYEING OR PRINTING OF ENDLESS LENGTHS OF MATERIALS

Hans Fleissner, Basel, Switzerland, assignor to Vepa Aktiengesellschaft, Switzerland

Filed Jun. 20, 1975, Ser. No. 588,834
Int. Cl.[2] D06P *7/00;* **D06B** *5/08;* **D06C** *7/02*
U.S. Cl. 8—17 **8 Claims**



1. A process for the continuous dyeing or printing of a length of textile material having pile fibers on one side and a backing material on the other side, said backing material being made of shrinkable fibers which will be subjected to a change in length during fixation of dye to the pile fibers under saturated steam conditions, which comprises, successively, passing the length of textile material through a setting zone under tension, treating the fibers making up the backing material with a gaseous medium heated to a setting temperature for the shrinkable fibers during passage of the length of textile material through said setting zone, said backing material being heat-set in said setting zone by passing the textile material over a perforated surface of a sieve drum means with the backing material resting on the surface of the sieve drum means and by drawing the heated gaseous medium by suction through said textile material on the perforated surface of said sieve drum means, then passing the heat-treated length of textile material into a dye application system to apply dye to said pile fibers, and thereafter fixing the dye to said pile fibers by passing the dye-containing length of textile material through a zone wherein the length of textile material is subjected to saturated steam conditions.

4,101,271
TANNING SKINS USING POLYCARBOXYLIC ACID PARTIAL ESTERS

Wolfgang Bockelman, Leverkusen, and Hans Niederprum, Monheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 31, 1977, Ser. No. 802,100
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626429
Int. Cl.[2] C14C *3/02, 3/06*
U.S. Cl. 8—94.26 **9 Claims**

1. In the chrome-tanning of skins with a chromium(III) salt and an acid-binding agent, the improvement which comprises effecting the chrome-tanning in the presence of a water-soluble partial ester of a polycarboxylic acid containing 4 to 11 carbon atoms which ester hydrolyzes into the free acid or its salt.

5. A tanning composition comprising a chromium(III) salt, an acid-neutralizing agent and a water-soluble partial ester of a polycarboxylic acid containing 4 to 11 carbon atoms which ester hydrolyzes into the free acid or its salt when the composition is employed in tanning.

4,101,272
PROCESS FOR THE TREATMENT OF WOOL WITH POLYORGANOSILOXANES

Geoffrey Bruce Guise, and Francis William Jones, both of Highton, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Oct. 5, 1976, Ser. No. 729,715
Claims priority, application Australia, Oct. 13, 1975, 3561/75
Int. Cl.[2] D06M *3/10, 3/02, 15/66, 15/52*
U.S. Cl. 8—127.6 **11 Claims**

1. A process for the treatment of fibrous materials which comprises the steps of treating the fibrous materials with a composition containing:

a component A selected from the class consisting of polyorganosiloxanes of the general formula

$$R_nSiO_{\left(\frac{4-n}{2}\right)}$$

in which n has an average value in the range 1.8 to 2.2, and R represents organic radicals attached to the silicon atoms by carbon-silicon bonds; wherein between 1.0 and 50% of the radicals R consist of one or more organic radicals containing an epoxide group and selected from the class consisting of: 1,2-epoxyethyl; 3,4-epoxycyclohexyl; 6-methyl-3,4-epoxycyclohexyl; 3,4-epoxycyclohexyl-1-ethyl; 9,10-epoxystearyl; 3-(2,3-epoxypropoxyl)propyl; p-(2,3-epoxybutyl)-phenyl; and 3-(3,4-epoxybutyl)cyclohexyl, and the remainder of the radicals R consist of one or more organic radicals selected from the class consisting of alkyl and aryl radicals; selected from the group consisting of:

(a) Diamines of the type $NH_2(CH_2)_nNH_2$, where n is 10 or greater;

(b) Amines of the type $YNH(CH_2)_nNH_2$, where n is 2 or greater; and Y is an alkyl radical containing more than 10 carbons;

(c) Linear or branched polymers of ethylene oxides or propylene oxides with terminal 2-aminoethyl or 2-aminopropyl either groups or mixtures of said polymers;

(d) Di- and higher amines prepared by the reduction of the nitriles of the polymers of unsaturated fatty acids;

(e) Products from the reaction of (d) with acrylonitrile which have been subsequently hydrogenated;

or an amine component C wherein C is an amine of the type $R'''NH_2$ or $R_2'''NH$ wherein R''' is an alkyl or alkenyl group containing twelve or more carbon atoms;

or a mixture of components B an C;

and allowing the components A and B to react chemically.

4,101,273

DISPERSE DYEING WITH POLYGLYCERINE ANIONIC EMULSIFIERS AND/OR POLYARYL POLYGLYCOL ETHERS

Takafumi Matsuba, Sakai; Ryozo Kuriyama, Ibaraki; Shin-Ichi Saitoh, Takarazuka, and Yoshio Ishitsuka, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

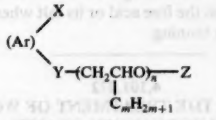
Filed Jun. 27, 1975, Ser. No. 590,947

Claims priority, application Japan, Oct. 24, 1974, 49 123245

Int. Cl.[2] D06P *1/607*

U.S. Cl. 8—172 R **13 Claims**

1. A method for dyeing or printing polyester fiber materials, which comprises (1) contacting the fiber material with a dye bath comprising a water-insoluble dye and at least one member selected from the group consisting of a polyoxyethylene of formula (I), and a glycerin derivative, formula (I) being represented by



(I)

wherein Ar is a naphthalene nucleus substituted by aryl-C_1-C_3 alkyl, or a benzene nucleus substituted by at least one aryl, aryloxy, aryl-C_1-C_3 alkyl or C_5-C_6 cycloalkyl, said aryl being hydrocarbyl unsubstituted or substituted by methyl or phenyl-C_1-C_3 alkyl;

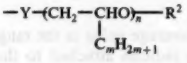
Y is —O—, —COO— or —CH_2O—;

m is a numeral 0 or 1;

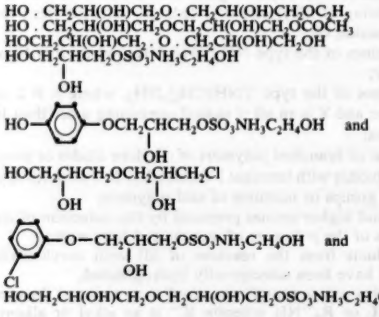
n is an integer of 1 to 30;

Z is alkali metal sulfato or phosphato, ammonium sulfato or phosphato, or monoethanolamine-, diethanolamine-, triethanolamine-, methylamine-, ethylamine- or butylamine-sulfato or phosphato salt;

and X is hydrogen or



in which Y, m and n are as defined above, and R^2 is alkali metal sulfato or phosphato, ammonium sulfato or phosphato, or monoethanolamine-, diethanolamine-, triethanolamine-, methylamine-, ethylamine- or butylamine-sulfato or phosphato; and the glycerine derivative being a compound selected from the group consisting of



and subjecting the resulting fiber material to a dry and/or wet heat treatment.

4,101,274

PROCESS FOR THE LEVEL DYEING OF SYNTHETIC FIBER MATERIALS

Helmut Beutler, Kerlkheim, Taunus; Friedrich Engelhardt, Frankfurt am Main; Karl Hintermeier, Frankfurt am Main, and Joachim Ribka, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

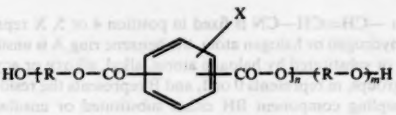
Filed Feb. 24, 1976, Ser. No. 660,831

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1975, 2508472

Int. Cl.[2] D06P *5/04*

U.S. Cl. 8—173 **17 Claims**

1. A process for the level dyeing of fiber material made from linear polyesters and from mixtures thereof with natural fibers, with water insoluble disperse dyestuffs according to the exhaust method, which comprises adding to the aqueous dyebath, in addition to the said dyestuffs and pH regulating substances, as levelling agents in an amount of 0.1–5 grams per liter a water soluble or dispersible linear polyester which has the general formula



I

in which *m* is zero or 1, *n* is a number such that the average molecular weight of the polyester is 800–5,000, each X, which may be the same or different, is H, —O—CH_2—CH_2—CH_2—SO_3M or —SO_3M, in which M is hydrogen or alkali metal or ammonium or substituted ammonium, and each R, which is the same or different, is a diol radical of 2–10 carbons of a saturated or unsaturated aliphatic, cycloaliphatic or aromatic compound and in which the meaning of X is balanced such that 5–30 mole % of all phenylene nuclei in formula I carry a sulfato-containing radical.

4,101,275

AUTOMATIC PHOTOMETRIC ANALYZER

Isamu Taguchi, Tokyo; Akihiro Ono, Ichigao, and Ryutaro Matsumoto, Tokyo, all of Japan, assignors to Nippon Steel Corporation and Kokoshi Electric Co., both of Tokyo, Japan

Division of Ser. No. 575,078, May 6, 1975, Pat. No. 4,003,708, which is a continuation of Ser. No. 511,205, Oct. 2, 1974, abandoned, which is a continuation of Ser. No. 283,851, Aug. 25, 1972, abandoned. This application Jul. 23, 1976, Ser. No. 707,993

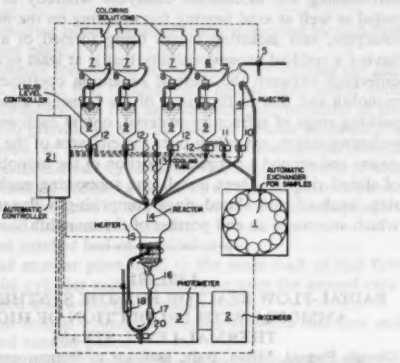
Claims priority, application Japan, Aug. 26, 1971, 46-65729

Int. Cl.[2] G01N *21/26*

U.S. Cl. 23—230 R **8 Claims**

1. A photometric batch type analysis method, comprising, feeding a sample solution and a coloring solution to a reactor form a reaction product, then feeding said reaction product to a recirculation system in which the reaction product is expanded to eliminate bubbles, measuring its absorbency and

forcing the reaction product back into the reactor by air pressure, removing the reaction product from said recirculation



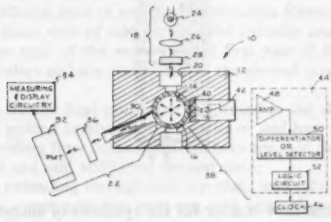
system after its absorbency has been measured a selected number of times.

4,101,276

METHOD AND APPARATUS FOR SIGNALLING THE INTRODUCTION OF CHEMICAL REACTION COMPONENTS INTO A CHEMICAL ANALYZING SYSTEM

Robert J. Anderson, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 2, 1976, Ser. No. 692,159
Int. Cl.[2] G01N *21/38, 33/16*
U.S. Cl. 23—230 B **16 Claims**



1. In a method of combining components of a chemical reaction which includes the steps of introducing the reaction components into a reaction zone to initiate the chemical reaction and measuring a characteristic of the reaction, the improved method of signalling the start of the chemical reaction comprising the steps of:

prior to initiating the chemical reaction adding a tagging substance to at least the reaction component last introduced into the reaction zone, the tagging substance remaining chemically isolated from the reaction; and

monitoring the reaction zone for the presence of the tagging substance and upon detecting the tagging substance generating a signal indicating the start of the chemical reaction.

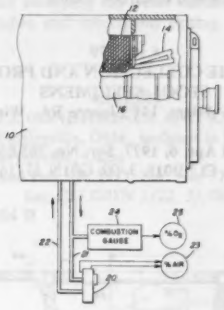
4,101,277

DETECTION OF INCIPIENT FAULTS IN HYDROGEN-COOLED GENERATORS

William M. Hickam, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1976, Ser. No. 732,631
Int. Cl.[2] G01N *31/00*
U.S. Cl. 23—232 R **8 Claims**

1. A method for detecting incipient faults in a dynamoelectric machine having a housing filled with a coolant gas comprising hydrogen containing not more than 10% air, said method consisting of measuring the free oxygen concentration of said coolant gas under normal conditions, monitoring the free oxygen content of said coolant gas during operation of



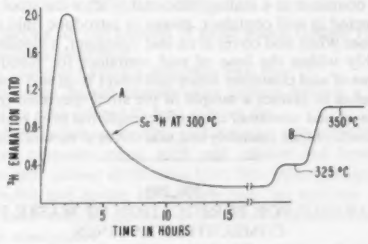
said dynamoelectric machine and detecting any substantial reaction of the free oxygen with hydrogen producing a concentration of free oxygen below that measured under said normal condition.

4,101,278

IONIZATION DETECTOR UTILIZING TRITIATED SCANDIUM WITH AN ACCEPTABLE TRITIUM EMANATION RATE AT HIGH TEMPERATURE

Charles Harold Hartmann, Moraga, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 232,016, Mar. 6, 1972, abandoned. This application Sep. 13, 1973, Ser. No. 396,921
Int. Cl.[2] G01N *31/08*
U.S. Cl. 23—232 C **4 Claims**



1. A method for analyzing the effluent of a gas chromatograph at temperatures above 300° C without exceeding an acceptable tritium emanation level, said method comprising the steps of:

(a) heating a tritiated scandium β particle source in a heatable vessel at a treatment temperature in excess of 250° C, said source initially exhibiting an unacceptable tritium emanation ratio at temperatures above 250° C, until the tritium emanation ratio of said source has passed through a maximum value;

(b) heating the effluent of a chromatographic column to a temperature in excess of 300° C;

(c) conducting said heated effluent to a zone in proximity with electrode means for creating a difference of electrical potential, said effluent being maintained at a temperature greater than 300° C;

(d) removing said source from said vessel after the tritium emanation ratio of said source has passed through said maximum value, and disposing said source with respect to

said zone in proximity with said electrode means so that β particle emissions from said source can ionize said effluent; and

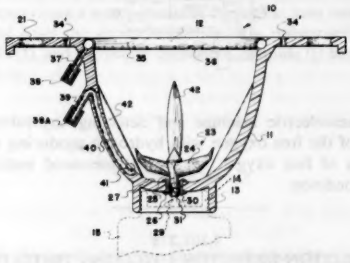
(e) measuring the fluctuation in electron current as a function of time as said effluent passes through said zone in proximity with said electrode means.

4,101,279

DEVICE FOR THE COLLECTION AND PROCESSING OF STOOL SPECIMENS

Muhammed Javed Aslam, 141 Linacre Rd., Winnipeg, Canada (R3T 3R5)

Filed Apr. 6, 1977, Ser. No. 785,035
Int. Cl.[2] B01L *3/00*; G01N *33/16*
U.S. Cl. 23—259 **17 Claims**



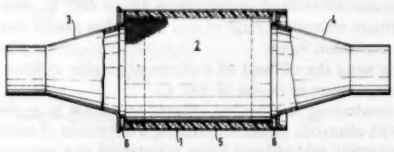
1. A disposable device for the collection and subsequent testing of formed stool samples, for use with a conventional toilet bowl and seat therefor and with a source of power operating a blender blade assembly; comprising in combination a bowl-shaped container having an open upper end and a base, means for detachably supporting said container upon a toilet bowl whereby the container is held in place by the seat of the toilet bowl, a separate cover for engaging the open upper end of the container in a sealing relationship after the stool sample is collected in said container, means to introduce fluid into the container when said cover is on said container, a blender blade assembly within the base of said container for blending the contents of said container when said cover is on said container, and means to extract a sample of the stool specimen from the interior of said container after said sample has been blended by said blender blade assembly and said cover is on said container.

4,101,280

APPARATUS FOR PURIFICATION OF WASTE FROM COMBUSTION ENGINES

Gunther Frietzsche, Edenkoben, Pfalz; Peter Krause, Hochstadt, and Christian Schulten, Didenhofen, all of Germany, assignors to Paul Gillet GmbH, Edenkoben, Pfalz, Germany

Filed Dec. 6, 1976, Ser. No. 748,047
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 7541252[U]
Int. Cl.[2] B01J *8/02*; F01N *3/15*
U.S. Cl. 23—288 FC **5 Claims**



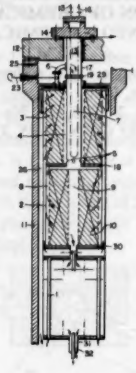
1. In an apparatus for the purification of exhaust gases from combusion engines which comprise at least one monolithic catalyzer block retained within a tubular metal housing, the improvement comprising jacketing means consisting essentially of compressed fibrous ceramic matt material completely surrounding the monolithic catalyzer whereby to take up radial as well as axial bearing forces acting on the monolithic catalyzer, said jacketing means being formed of a material having a residual expansionability that is at least equal to the difference between the thermal expansion coefficient of the monolith and that of the metal of the housing, a pair of end packing rings of refractory material, one at each end of said jacketing means, extending over the end area of the jacketing means and around a peripheral portion of the monolith, a pair of slitted rings of sheet metal, one supporting each packing ring, each of said slitted rings comprising a flange portion which surrounds an end portion of the monolith.

4,101,281

RADIAL-FLOW REACTOR FOR THE SYNTHESIS OF AMMONIA WITH PRODUCTION OF HIGH THERMAL-LEVEL STEAM

Giorgio Pagani, Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Filed Jul. 14, 1976, Ser. No. 705,013
Claims priority, application Italy, Jul. 15, 1978, 25421 A/75
Int. Cl.[2] B01J *8/04, 3/00*; C01C *1/04*; F22B *1/18*
U.S. Cl. 23—288 K **3 Claims**



1. A radial-flow reactor for the synthesis of ammonia with the production of steam having a high thermal level, comprising

a generally vertically extending outer cylindrical shell of alloyed steel;

a lid having a central bore mounted on the top of said shell;

a top plate having a central bore fixed to the inner wall of said shell at a point spaced below said lid;

a first coaxial cylinder mounted in said shell below the top plate, adjacent the bottom surface of said top plate, said first cylinder having its outer wall spaced from the inner wall of the shell to provide a first duct of annular cross-section, said first duct being in flow communication with the space in said outer shell between said lid and said top plate through the outer circumferential portion of said top plate;

a boiler of the U or bayonet tube bundle type extending through said bores into the shell;

a flange having an annular groove in its lower face connecting the boiler to the lid;

an intake nozzle coupled, through said flange, to the inlet of said boiler for delivering water to the boiler;

a discharge nozzle coupled, through said flange, to the outlet of said boiler for discharging steam from the boiler;

a first annular plate fixed to the inner wall of said first coaxial cylinder;

a cylindrical tube enclosing said boiler having its lower end fixed to said first annular plate and its upper end extending into and sealingly engaged within said groove in the flange;

a first catalyst bed of toroidal shape supported by said first annular plate;

a first pair of foraminous coaxial cylinders forming the side walls of said first catalyst bed, having their lower ends supported by said first annular plate and mounted in the shell to provide an internal duct of annular cross-section between the inner of said first pair of foraminous coaxial cylinders and said cylindrical tube, the top portion of said first catalyst bed being closed by an annular plate disposed between the inner of said first pair of foraminous cylinders and said first coaxial cylinder;

a second catalyst bed of toroidal shape;

a second annular plate fixed to the inner wall of said first coaxial cylinder and adapted to support the second catalyst bed below the first catalyst bed;

a second coaxial cylinder extending between said first and second annular plates;

a second pair of foraminous coaxial cylinders forming the side walls of the second catalyst bed, having their lower ends supported by said second annular plate and mounted in the shell to provide a second duct of annular cross-section between the outer of said second pair of foraminous cylinders and the inner surface of said second coaxial cylinder, said second duct being in flow communication with said boiler; the top of said second pair of foraminous cylinders being closed by a circular plate over the outer of said second foraminous cylinders;

a plurality of openings formed near the lower end of said boiler-enclosing tube to provide flow communication between said internal and second annular ducts;

a central cylindrical duct formed by the inner of said second pair of foraminous cylinders, said central cylindrical duct being in flow communication with a central bore in said second annular plate;

an additional duct of annular cross-section formed between the inner wall of said first coaxial cylinder and both the outer wall of the outer of said first pair of foraminous cylinders and the outer wall of the second coaxial cylinder;

a tube bundle heat exchanger supported in the shell below said second catalyst bed, the tubes of said heat exchanger providing flow communication between said first annular duct and said additional annular duct;

a tube extending through said top plate, said tube providing flow communication between said internal annular duct and the boiler;

valve means in said tube for controlling flow therethrough;

an inlet adapted to admit synthesis gas to the space between the lid and said top plate;

conduit means providing flow communication between the central cylindrical duct in the second catalyst bed, through said second annular plate and into said heat exchanger for introducing reacted gas from said second catalyst bed into said heat exchanger to sweep the outer surfaces of the heat exchanger tubes;

a generally cylindrical exit duct affixed to the bottom of said reactor for exhausting the reacted gas;

a second tube coaxial with said exit duct, said second tube extending through said heat exchanger and being in flow communication with said additional annular duct, through said conduit means, for supplying a starter gas to said reactor until said reactor has reached its steady state, such that cold gas admitted through said inlet to the space between said lid and said top plate flows into said first annular duct and passes through the tubes of said heat exchanger, through said additional annular duct and into said first catalyst bed, whereafter some reactant products of the first catalyst bed flow through said tube, from said internal annular duct, into said boiler-enclosing cylindrical tube and into said second annular duct while the remaining reactant products flow directly from said internal annular duct into said second annular duct which admits the reactant products of the first catalyst bed into said second catalyst bed to produce reacted gas flowing into said central cylindrical duct from which said conduit means introduces the resultant gas into said heat exchanger for sweeping the outer surfaces of the heat exchanger tubes and subsequent exiting through said exit duct.

4,101,282

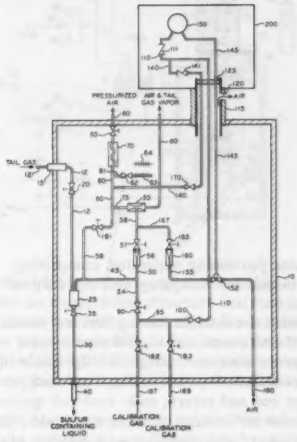
SAMPLE CONDITIONER AND ANALYZER

Otis E. Ririe, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 18, 1977, Ser. No. 770,252

Int. Cl.[2] G01N *1/22, 31/00*

U.S. Cl. 23—254 R **6 Claims**



1. A device for the analysis of gases which contain reactive components comprising:

a gas analyzer having a detection chamber;

an enclosed heated conditioning cabinet having a heater within said cabinet to heat cabinet air;

a heated conduit connecting said analyzer and said cabinet in open communication with said cabinet and heated by warmed cabinet air flowing from the cabinet through said conduit and having an opening near the analyzer end to exhaust warmed air from said cabinet and said conduit to the atmosphere;

a plug at the analyzer end of said heated conduit adapted to prevent air flowing from said cabinet through said heated conduit and exiting through said opening from entering said analyzer;

means for introducing a gas sample into said cabinet;

bypass means for diverting a portion of said gaseous sample introduced into said cabinet and for exhausting it from said cabinet without analysis:

sample conveying means for transporting a predetermined portion of said gaseous sample through said heated cabinet and said heated conduit and into said detection chamber, said sample conveying means including a sample line for carrying of said gaseous sample, extending from the cabinet through the conduit to the detection chamber of said analyzer;

purging means for selectively purging said sample conveying means with air, said purging means including a purge line for carrying of air, leading from the cabinet through said heated conduit and said plug and into said analyzer, said purge line being in open communication with said sample line; and

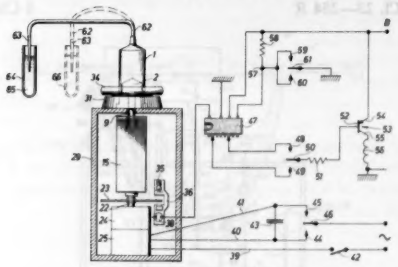
means for withdrawing a portion of said gaseous sample from said detection chamber of the analyzer to the cabinet and for exhausting it from said cabinet, said sample withdrawing means including a line leading from the analyzer through said heated conduit into said cabinet.

4,101,283

DISPOSABLE REAGENT CONTAINER AND ACTUATION MECHANISM

Karl Erik Sundstrom, 114, ch. de La Montagne, 1224 Chene-Bougeries, Geneva, Switzerland (1224)

Filed Jul. 13, 1976, Ser. No. 704,927
Int. Cl.[2] G01N *1/14;* G01F *11/06*
U.S. Cl. 23—259 **19 Claims**



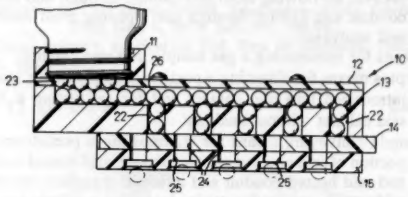
1. A volume portioning apparatus, comprising:
(a) pipe means for sampling and delivery of volumetric material;
(b) a cylindrical container having first and second ends with said first end connected to said pipe means;
(c) plunger means cooperating with the inside of said cylindrical container for movement from said second end to said first end and return; and
(d) means for performing movements of said plunger means into and out of said container with rotation of said plunger means.

4,101,284

MULTIPLE BEAD DISPENSER FOR DIAGNOSTIC ASSAY

Joseph J. Difiglio, Vernon Hills, and Richard W. George, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 25, 1977, Ser. No. 844,667
Int. Cl.[2] G01N *33/16;* B65G *65/60*
U.S. Cl. 23—259 **4 Claims**



1. An apparatus useful for simultaneously dispensing a plurality of beads to be used as solid supports in the performance of immunologic diagnostic assays which comprises:
(a) a threaded container support having an opening for the delivery of beads from a container into the apparatus;
(b) a block defining a reservoir having a bottom with a plurality of vertical apertures extending downwardly from the bottom and having a cover with a portal communicating with said opening in the threaded container support.
(c) a base plate mounted beneath and peripherally on no more than three sides to said reservoir block, having a plurality of vertical apertures located in a position predetermined to be unaligned with the apertures in the bottom of the reservoir block and extending downwardly from the bottom through the base plate;
(d) a sliding plate situated between the reservoir block and the base plate and within the peripheral attachment of said block and plate having a plurality of vertical apertures located in a predetermined position to be aligned with said apertures in the bottom of the reservoir plate and extending downwardly to the surface of said base plate; and
(e) a biasing means constructed in a range to permit lateral movement of the sliding plate sufficient to align the vertical apertures in the sliding plate with those of the base plate and return the sliding plate so that its vertical apertures again align with those of said reservoir.

4,101,285

METHODS AND APPARATUS FOR EXTRACTING JUICES FROM JUICE-LADEN SOLID MATERIALS

Sydney E. Tilby, 716 E. Ridge Pl., Victoria, British Columbia, Canada

Filed Sep. 27, 1976, Ser. No. 726,752
Int. Cl. B01d *11/02*
U.S. Cl. 23—270 B **8 Claims**

1. Diffuser apparatus for extracting juice from juice-laden material comprising:
tank means defining a row of successive material treatment stations;
a perforated basket associated with each of said stations;
each basket being mounted for movement into and from its associated treatment station;
each basket including sections which are collapsible about a hinge axis disposed between said sections from an open condition defining an open chamber of given volume capacity to a collapsed chamber of reduced volume capacity;
each basket being operable to receive a charge of said material while in said open condition;
means for conducting a flow of liquid through said tank means to extract juice from said material; and
basket actuating means for applying a transfer force to each basket in a direction to sequentially:
collapse each basket to compress material contained therein so as to squeeze juice therefrom; and
transfer each basket means from its associated station to a generally inverted position over a succeeding station to discharge said charge of compressed material.

4,101,286

BUBBLE FORMING DEVICE HAVING NO MOVING PARTS

Jun-ichi Nagao; Hiroyuki Machiguchi, and Yoshikazu Yamamichi, all of Okayama, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,588
Int. Cl.[2] B01J *10/00;* C02D *1/00*
U.S. Cl. 23—283 **4 Claims**

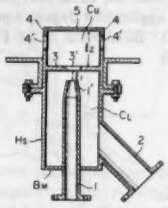
1. A bubble-forming device having no moving parts which comprises:
a housing (H_S) including a ceiling member (5), a side-wall (4), a bottom (B_M), and a horizontal partition (3) dividing the inside of said housing into upper and lower chambers

(C_L and C_U), said horizontal partition (3) having an orifice (3') in the center thereof;

the lower chamber (C_L) having:

a gas-introducing pipe (1) having a nozzle (1') on the top thereof aligned with and directed toward said orifice, said gas-introducing pipe being vertically fixed at the bottom (B_M) of said housing leaving a narrow space between the nozzle tip (1') and the orifice (3'); and

a liquid-introducing pipe (2) through which liquid is to be taken in; and the upper chamber (C_U) having:



said ceiling member (5) located at a short distance from the partition (3), against which a high velocity stream of the gas-liquid mixture passed through the orifice (3') is to be directed; and

at least one orifice (4') provided in the upper side wall (4) of said housing through which the fully mixed fluid containing an enormous number of very fine air bubbles is to be discharged.

4,101,287

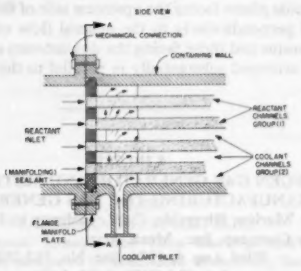
COMBINED HEAT EXCHANGER REACTOR

Norman H. Sweed, Princeton Jct.; John P. DeLuca, New Providence, and Kenneth Kamholz, Cherry Hill, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 21, 1977, Ser. No. 761,495

Int. Cl.[2] B01J *8/00;* **F28D** *7/00;* **F28F** *1/04*

U.S. Cl. 23—288 K **12 Claims**



1. A one-piece integral, high strength combined heat exchanger reactor comprising a honeycomb possessing any regular repeating tesselation pattern of channels, wherein the channels are divided into a multiplicity of separate groups wherein one group of channels extends outward parallel to the direction of flow in the honeycomb, perpendicular to the cross-section of the honeycomb, each wall of this outwardly extending channel group being surrounded by and in contact through common walls with channels of a separate channel grouping, each channel of the outwardly extending group being separated from other channels of the same group by the presence of the intervening channels, which honeycomb system is manifolded and mechanically enclosed so as to form a separation of entrances of the extending channels as compared to the recessed channels of the separate group.

4,101,288

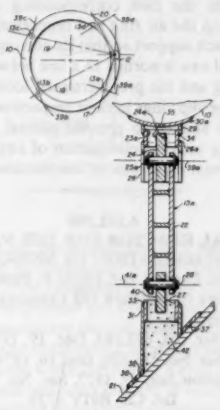
METHOD AND A SUPPORT ASSEMBLY FOR SUPPORTING AN AIR RING IN A REGENERATOR IN A FLUID CATALYTIC CRACKING UNIT

James A. Smith, Houston; John P. MacLean, Stafford, and Thomas W. DeBoise, Missouri City, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,189

Int. Cl.[2] B01J *8/24;* **F16M** *13/02;* **B23K** *28/00*

U.S. Cl. 23—288 B **20 Claims**



1. A method for forming a support assembly for supporting a mechanism on a supporting structure that may operate in the high temperature environment of at least 1,100°–1,400° F. wherein the support assembly comprises a primary support and a plurality of upright elongated secondary supports, each secondary support having first and second slip rings and pivot pins comprising the steps of,

(a) fixedly securing a primary support between the mechanism at a predetermined first location point and the supporting structure,

(b) pivotally mounting a first slip ring on a first pivot pin in one end of a first one of the plurality of elongated supports and pivotally mounting a second slip ring on a second pivot pin in the other end of the one elongated support,

(c) extending an outer portion of the first slip ring into a first sleeve fixedly secured to the supported mechanism,

(d) extending an outer portion of the second slip ring into a second sleeve fixedly secured to the supporting structure,

(e) aligning the first pivot pin so that its longitudinal axis is normal to a line between the center of the first slip ring and the predetermined first location point,

(f) fixedly securing the second slip ring to its supporting structure second sleeve with the first slip ring so aligned, and then,

(g) fixedly securing the first slip ring to its supported mechanism first sleeve so that with any thermal expansion or contraction of the elongated supports, the supported mechanism, and the supporting structure due to operating in the high temperature environment causes pivotal movement of the first slip ring about its pivot pin and pivotal movement of the second slip ring about its pivot pin for preventing undue, intolerable, and unacceptable stresses in the fixed connections of the two slip rings, the two sleeves, and in portions of the supported mechanism and supporting structure adjacent the fixed connections, and whereby a simple and economical support assembly is formed because orientation and installation of the slip rings are easily and conveniently facilitated.

11. A method for forming a support assembly for supporting an air ring in a regenerator in a fluid catalytic cracking unit operating in the temperature range of at least 1,100°–1,400° F. comprising the steps of,

(a) welding an air inlet header between the air ring at a predetermined location point and the bottom of the regenerator,

(b) connecting other elongated supports under the air ring, said step of connecting said elongated supports comprising,

(c) pivotally mounting slip rings on pivot pins on opposite ends of each of the other supports, the two pins on each support being formed parallel to each other,

(d) inserting the pivotally mounted pair of slip rings of each support into the two corresponding sleeves mounted oppositely on the air ring and regenerator,

(e) aligning each support so that its corresponding pivot pin longitudinal axis is normal to a line between the center of the slip ring and the predetermined location point, and

(f) welding the slip rings in their respective sleeves with the supports so aligned to provide pivotal movement about the slip ring pins for elimination of any bending stresses due to thermal expansion or contraction.

4,101,289

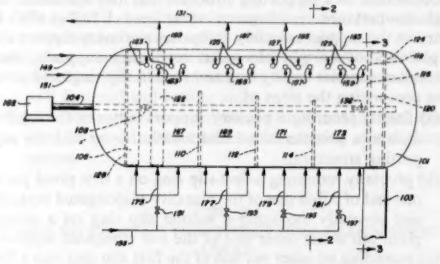
HORIZONTAL REACTOR FOR THE VAPOR PHASE POLYMERIZATION OF MONOMERS

James L. Jezl, St. Charles, and Edwin F. Peters, Winfield, both of Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Division of Ser. No. 642,583, Dec. 19, 1975, which is a continuation of Ser. No. 533,020, Dec. 16, 1974, abandoned. This application Jan. 19, 1977, Ser. No. 760,639

Int. Cl.[2] B01V *8/36*

U.S. Cl. 23—288 E **8 Claims**



1. Apparatus for the vapor phase polymerization of at least one polymerizable monomer comprising:

(a) a horizontal reactor of substantially circular cross-section containing a centrally-located drive shaft extending longitudinally through said reactor to which are attached a plurality of adjacently located paddles, which paddles cause essentially no forward or backward movement of the particulate matter contained in said reactor and extend transversely within and to a short distance from the internal surfaces of said reactor, said reactor being divided into two or more individually polymerization-temperature-controllable polymerization sections by one or more barriers so constructed to allow free reactor gas mixing in said reactor and to control movement of said particulate matter between said sections;

(b) driving means for said drive shaft;

(c) One or more reactor off-gas outlets spaced along the topward part of said reactor;

(d) one or more vapor recycle inlets spaced along the bottomward part of said reactor;

(e) one or more catalyst addition inlets spaced along said reactor;

(f) a plurality of quench liquid inlets spaced along the topward part of said reactor whereby quench liquid can be introduced into said two or more sections of said reactor; and

(g) take-off means for said particulate matter at one end of said reactor.

4,101,290

CATALYTIC REACTION APPARATUS

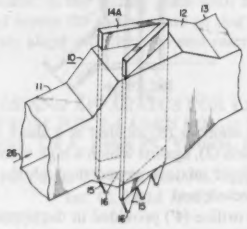
Norio Arashi; Yukio Hishinuma, and Tadayoshi Murakami, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of, Japan

Filed Mar. 23, 1976, Ser. No. 669,701

Claims priority, application Japan, Apr. 9, 1975, 50-42278

Int. Cl.[2] B01J *8/02, 8/04;* **F01N** *3/15*

U.S. Cl. 23—288 R **8 Claims**



1. A catalytic reaction apparatus for removing a component from a gas by providing a catalyst-packed bed filled with catalysts therein in the gas, and making the gas pass through the catalyst-packed bed, which comprises the catalyst-packed bed being extended in a vertical direction with respect to gas flow and wherein said catalyst packed bed comprises wall surfaces extended in said vertical direction formed from flat plates, said wall surfaces forming an approximately V-shaped structure, with the open end of the approximately V-shaped structure facing an upstream side of the gas flow, wherein said approximately V-shaped structure is provided with a plurality of flow-rectifying guide plates having an equal length from wall surfaces of the catalyst-packed bed, wherein the flow-rectifying guide plates facing the upstream side of the gas flow are arranged perpendicularly to the general flow of gas through said apparatus and those facing the downstream side of the gas flow are arranged substantially in parallel to the gas flow.

4,101,291

OXYGEN GAS GENERATOR AND METHOD OF MANUFACTURING THE GAS GENERATOR

Frank A. Marion, Riverside, Calif., assignor to Universal Propulsion Company, Inc., Mesa, Ariz.

Filed Aug. 6, 1976, Ser. No. 712,280

Int. Cl.[2] C10L *5/02, 5/00*

U.S. Cl. 44—17 **19 Claims**

10. In combination in a generator for generating gases at a relatively high temperature,

a clay having a good green strength and having nonhydrophyllic properties and having a percentage by weight no greater than approximately 20% in the mixture,

coke particles serving as a fuel and having properties of being retained by the clay in dispersed form at individual positions in the clay and having a percentage by weight no greater than approximately 25% in the mixture, and

an oxidizer having properties of decomposing to provide oxygen for combustion of the oxygen with the coke at the localized positions and having a percentage by weight of at least 60% in the mixture,

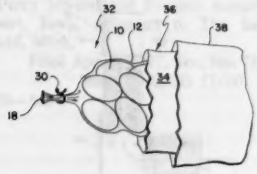
the clay having a melting temperature above the temperature at which the oxidizer decomposes.

4,101,292

CHARCOAL BRIQUETTE PACKAGING TECHNIQUE

Robert Paul Hogan, II, P.O. Box 18285, Corpus Christi, Tex. 78418

Filed Aug. 10, 1977, Ser. No. 823,454
Int. Cl.[2] C10L *11/00;* B65D *65/00*
U.S. Cl. 44—40 11 Claims



1. A charcoal briquette packaging comprising

a sealed gas impermeable organic polymeric inner bag having therein a multiplicity of abutted charcoal briquettes, the bag being collapsed about the briquettes to provide a compact unbendable unit having a substantially reduced gas volume therein;

a fiber covering, juxtaposed to the inner bag, impregnated with a flammable liquid; and

a sealed gas impermeable organic polymeric outer bag surrounding the fiber covering.

9. A method of packaging charcoal briquettes, comprising

placing a multiplicity of charcoal briquettes in a gas impermeable organic polymeric first bag;

steps for replacing the oxygen containing atmosphere in the first bag with an inert gas atmosphere and collapsing the first bag;

sealing the first bag;

juxtaposing a fiber material in intimate contact with the first bag;

impregnating the fiber material with a flammable liquid; and

steps for sealing the fiber material, first bag and briquettes in a partially evacuated gas impermeable organic polymeric second bag.

4,101,293

STABILIZING EMULSIFIERS

Arthur Waldemar Krause, and John Korose, both of Gulf Breeze, Fla., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,634
Int. Cl.[2] C10L *1/18, 1/32*
U.S. Cl. 44—51 23 Claims

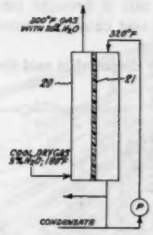
1. A storage stable coal and oil fuel mixture comprising (A) from about 0.1 part to about 10 parts of a stabilizing emulsifier comprising reacting at a temperature ranging from about 0° to about 160° C (I) at least one ethylenically unsaturated or ethylenically polyunsaturated aliphatic carboxylic acid or cycloaliphatic carboxylic acid containing from about 5 to about 36 carbon atoms and mixture thereof with (II) at least one member selected from a group consisting of the salt of an organic carboxylic acid, alkali metal hydroxides and alkanolamines with mixing until the reaction between (I) and (II) is complete and (B) from about 50 parts to about 1 part of pulverized coal and (C) from about 50 parts to about 99 parts of liquid petroleum hydrocarbon fuel oil.

4,101,294

PRODUCTION OF HOT, SATURATED FUEL GAS

Shiro G. Kimura, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,335
Int. Cl.[2] C10J *1/00*
U.S. Cl. 48—77 11 Claims



1. In apparatus for the production of a low BTU fuel gas stream comprising in combination a coal gasifier and, thereafter in sequential flow communication therewith, means for adding water to the product gas stream from said coal gasifier to reduce the temperature thereof; heat exchange means for further reducing the temperature of said product gas stream sufficient to condense water therefrom; means for reducing the hydrogen sulfide and ammonia content of said product stream; and means for reheating said product stream and increasing the water vapor content thereof by means of a hot liquid, the improvement in which the means for reheating the product stream and increasing water vapor content thereof comprises in combination:

an enclosure;

means disposed in said enclosure for defining two separate flow volumes therein;

means connected to said enclosure for admitting a first fluid flow into one of said flow volumes;

means connected to said enclosure for removing first fluid flow from said one flow volume;

means connected to said enclosure for admitting a second fluid flow into the other of said flow volumes; and

means connected to said enclosure for removing second fluid flow from said other flow volume;

said defining means being formed at least in part as a microporous barrier;

said microporous barrier being made of a material selected from the group consisting of hydrophobic polymer material and hydrophilic polymer material having a gel structure.

4,101,295

APPARATUS FOR CONVERTING COAL INTO GAS SUBSTITUTES

John H. Sadler, 16 Lakeside La., Bolton, Conn. 06040

Filed Aug. 16, 1976, Ser. No. 714,765
Int. Cl.[2] C10J *3/58*
U.S. Cl. 48—99 11 Claims

1. An apparatus for converting coal into a natural gas substitute comprising:

a furnace defining a first heating chamber and a second heating chamber,

a means connecting said first heating chamber in communication with said second heating chamber,

a burner disposed in said first heating chamber for generating heating products of combustion,

said connecting means including a temperature controlled damper to regulate the flow of said heating products of combustion between said first and second heating chambers,

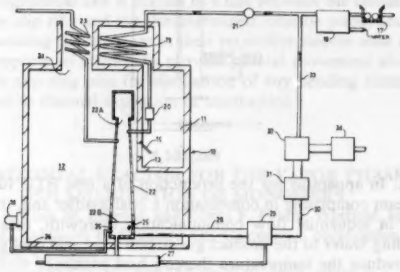
a catalytic chamber containing a catalytic agent disposed in

said second heating chamber in heat transfer relationship to the heating products of combustion therein,

means for mixing pulverized coal with water to form a slurry mix,

means for conducting said slurry mix in heat transfer relationship to the heating gases in said second chamber for preheating said slurry mix, and said conducting means being connected to said catalytic chamber whereby said preheated slurry mix is brought into contact with the catalytic agent in said catalytic chamber to form a catalyzed heat emulsion,

a convertor chamber disposed in said first heating chamber,



means connecting said catalytic chamber to said convertor chamber whereby the heated catalyzed emulsion flows from said catalytic chamber to said convertor chamber,

a steam generator disposed in said first heating chamber in heat transfer relation to the heating combustion gases therein,

said steam generator being connected to said convertor for introducing steam in said convertor to mix with the catalyzed emulsion introduced thereinto,

said burner means heating said convertor chamber to coal distillation temperatures to produce the coal gas constituents,

and means for removing the coal gas constituents from said convertor chamber.

4,101,296

OZONE DECOMPOSITION AND ELECTRODESORPTION PROCESS

Frank Eugene Lowther, Severna Park, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 568,933, Apr. 17, 1975, abandoned, and a continuation-in-part of Ser. No. 694,017, Jun. 7, 1976, Pat. No. 4,038,050, and a continuation-in-part of Ser. No. 768,763, Feb. 15, 1977, which is a continuation-in-part of Ser. No. 625,237, Oct. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 527,832, Nov. 27, 1974, abandoned. This application Apr. 20, 1977, Ser. No. 789,307

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

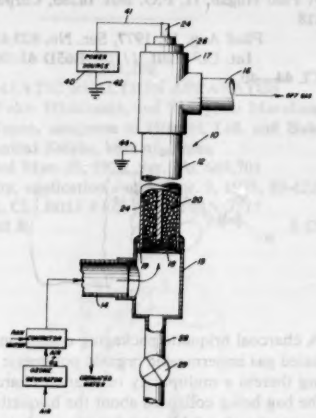
Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—33 **12 Claims**

1. A method for decomposing ozone which comprises:

(a) contacting a gas mixture which includes ozone and water vapor with a bed of crystalline alumino-silicate zeolite, said zeolite being active for the decomposition of ozone; and

(b) maintaining the activity of said zeolite bed by the application of a 0–10^3 Hz electrical field of at least 0.2 Kv/cm across the bed to maintain a current density of about 0.01



to 100 microamps/cm^2 to remove water from said bed as molecular water.

4,101,297

PROCESS FOR RECOVERING A SOLVENT VAPOR

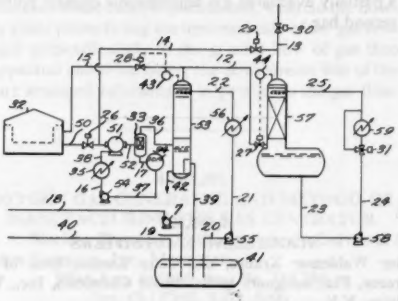
Kazumi Uda, Fukuyama; Motohiko Tamura, Mihara; Ichiro Nishiura, Takehara, and Hiroshi Fujiike, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 732,074, Oct. 13, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,263

Claims priority, application Japan, Oct. 15, 1975, 50-124061

Int. Cl.[2] B01D *19/00, 53/14*

U.S. Cl. 55—43 **13 Claims**



1. A process for recovering solvent vapor in an absorbing liquid and regenerating the absorbing liquid, comprising:

(a) absorbing a solvent vapor in a cooled absorbing liquid to form an enriched cooled absorbing liquid;

(b) desorbing a portion of solvent vapor from said enriched cooled absorbing liquid by warming said enriched cooled absorbing liquid, exposing said enriched absorbing liquid to a constant low vacuum regeneration stage and desorbing and recovering a portion of solvent vapor from said enriched absorbing liquid;

(c) re-exposing said enriched absorbing liquid to said constant low vacuum regeneration stage and desorbing and recovering another portion of solvent vapor from said enriched absorbing liquid; and

(d) repeatedly re-exposing said enriched absorbing liquid to said constant low vacuum regeneration stage and desorb-

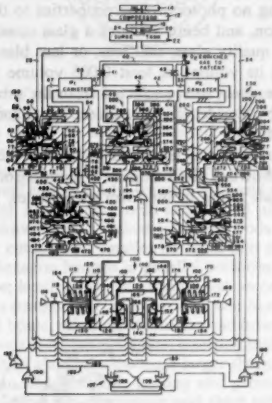
ing and recovering additional portions of solvent vapor from said enriched absorbing liquid thereby regenerating said absorbing liquid.

4,101,298

PRESSURE CYCLING CONTROL FOR FLUID SEPARATOR MECHANISM

William Perry Myers, and Terence August Torzala, both of Davenport, Iowa, assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 5, 1977, Ser. No. 784,901
Int. Cl.[2] B01D *53/00*
U.S. Cl. 55—163 **14 Claims**



1. In a breathing system wherein a breathable fluid is separated from a source of fluid mixture through retention of a component in the fluid mixture by an adsorption material located in first and second chambers, control means for regulating the communication of the source of fluid mixtures to the first and second chambers comprising:

first valve means for allowing said source of fluid mixture to freely flow to the first chamber while communicating the second chamber to the atmosphere in a first portion of a mode of operation;

second valve means for allowing said source of fluid mixture to freely flow to the second chamber while communicating the first chamber to the atmosphere in a second portion of the mode of operation;

first sensor means connected to said first chamber for developing a first sensor signal corresponding to the fluid pressure in said first chamber;

second sensor means connected to said second chamber for developing a second sensor signal corresponding to the fluid pressure in said second chamber; and

logic sequencer means responsive to said first and second sensor signals for pneumatically operating the first and second valve means during the first and second portions of the mode of operation.

4,101,299

APPARATUS FOR DISCHARGING SMOKES, FUMES AND GREASES FROM KITCHENS

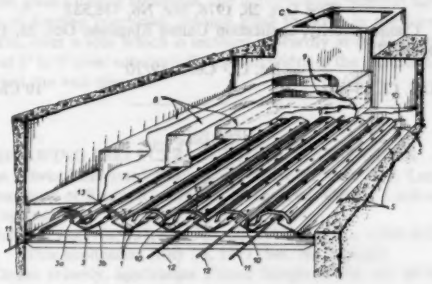
Albert Flamidien Bertucci, Golbey, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Dec. 28, 1976, Ser. No. 755,002
Claims priority, application France, Dec. 31, 1975, 75 40315
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—222 **7 Claims**

1. An installation for discharging smoke, fumes and greases from various premises, more particularly from restaurant or community kitchens comprising

a set of hollow ceiling elements each shaped as a long hollow gutter tile having its concave surface facing downwardly and having slits therebetween for discharging smoke and fumes,

a water circulation pipe system,



piping means connecting said hollow elements for passage of water between and through said elements, and connected to said water circulation pipe system,

drains extending beneath said hollow elements with slits between said drains for the passage of smoke and fumes therebetween, said drains connected to a sewer,

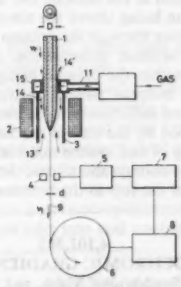
said hollow ceiling elements forming water-cooled condensers having heat-transfer surfaces for collecting the grease for discharge by said drains.

4,101,300

METHOD AND APPARATUS FOR DRAWING OPTICAL FIBER

Katsuyuki Imoto, Sayama; Gyozo Toda, Hino, and Masao Sumi, Higashiyamato, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of, Japan

Filed Nov. 23, 1976, Ser. No. 744,454
Claims priority, application Japan, Nov. 27, 1975, 50-142055; Dec. 22, 1975, 50-151825; Mar. 22, 1976, 51-29960
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 **30 Claims**



1. In an apparatus for drawing an optical fiber having a heater for heating an optical fiber preform and a pulling arrangement for drawing out an optical fiber from said preform, the forward end portion of which has been fused by said heater, the improvement comprising:

first means for detecting the diameter of said optical fiber, and

second means for controlling a predetermined amount of gas flow along the outer peripheral surface of the fused part of

said preform in response to detected fluctuations of said optical fiber diameter.

4,101,301

FORMATION OF SPHERES OF THERMOPLASTIC MATERIALS, ESPECIALLY GLASS

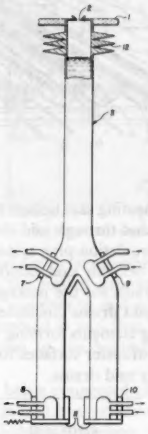
Zvi Rigbi, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd., Haifa, Israel

Filed Oct. 28, 1976, Ser. No. 736,532

Claims priority, application United Kingdom, Oct. 28, 1975, 44456/75

Int. Cl.[2] C03B *19/10*

U.S. Cl. 65—21 **10 Claims**



1. A method for manufacturing hardened spheres from molten material, comprising:

filling a column with a liquid which either does not react chemically at all, or does so only to an insignificant extent, with said molten material and which has a specific density less than that of the material at the temperature in the column, said specific density difference being between 0.05–0.2;

causing a graduation of temperature of the liquid in the column such that the liquid at the top of the column is hotter than that at the bottom, the temperature at the top of the column being above the temperature at which the material passing through the column is sufficiently hard to be handled without deformation, and the temperature graduation within the column being such that a drop of said molten material passing through said column will have hardened sufficiently to be handled without danger of deformation by the time it reaches the bottom; and

allowing a drop of said molten material to enter the liquid at the top of the column and to pass through the liquid in the column, from the top to the bottom thereof.

4,101,302

PHOTOCHROMIC GRADIENT LENSES

David A. Krohn, Southbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 668,175, Mar. 18, 1976, Pat. No. 4,036,624, which is a division of Ser. No. 624,688, Oct. 22, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,585

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

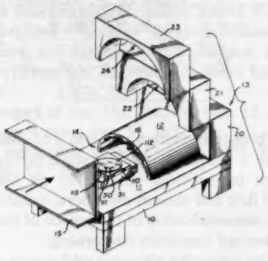
Int. Cl.[2] C03C *15/00;* **C03B** *31/00*

U.S. Cl. 65—30 R **5 Claims**

1. In a method of making ophthalmic quality lenses, or lens blanks, having a reversible, progressive, local variation in phototropic, or photochromic, behavior, said lens or lens blank including a portion ultimately to serve as a distance portion and another portion ultimately to serve as a near portion, the distance portion and near portion being contiguous with the near portion being below the distance portion when the lens is glazed in a frame, the reversible, progressive, local variation in phototropic or photochromic behavior being substantially more resistant to light transmission near the top which defines the upper limit of the distance portion thereof and substantially less resistant to light transmission in the near portion when said lens is glazed in a frame, the transition in light transmission from the top of the lens to the bottom being substantially uniform laterally of said lens when glazed,

comprised of an unnucleated oxide glass lens or lens blank, exhibiting no photochromic properties to the eye before nucleation, and being made of a glass consisting of ophthalmic quality glass, said lens, or lens blank, containing through its volume at least 0.005 volume percent of at least one silver halide selected from the group consisting of silver chloride, silver bromide, silver iodide and mixtures thereof,

after nucleation in at least that portion of the lens, or lens blank, showing phototropic or photochromic behavior, said halide being in the form of particles, there being a



SCHEMATIC OF GRADIENT FURNACE

progressive variation in the average linear dimension of said particles substantially corresponding to the variation in phototropic or photochromic behavior of the lens, or lens blank, the average linear dimensions of said silver halide particles being smaller than about 5 nanometers in the near portion and said particles substantially, progressively, increasing in size to about 50 nanometers in the distance portion, the improvement comprising the step of

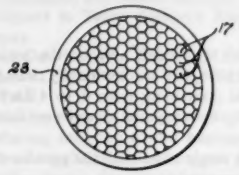
subjecting said glass lens, or lens blank, to a heat treatment, said heat treatment consisting of subjecting the distance portion of such a lens, or lens blank, to a temperature above the strain point but below the softening point thereof for a time period sufficient to grow silver halide particles having an average linear dimension of about 50 nm, substantially progressively lessening the temperature of heat treatment across said lens from the top edge which defines the upper limit of the distance portion to that area spaced therefrom which constitutes the near portion in such a manner as to form silver halide particles of progressively smaller average linear dimension to thereby produce a lens characterized by a local variation in phototropic or photochromic behavior

the greatest photochromic or phototropic behavior being exhibited in the distance portion.

4,101,303
PERFORATE GLASS STRUCTURES AND METHOD OF MAKING THE SAME

John Treagus Balkwill, Saugus, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 21, 1970, Ser. No. 128,598
Int. Cl.[2] C03C 15/00; C03B 23/20
U.S. Cl. 65—31 4 Claims

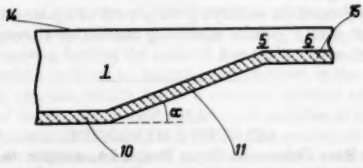


1. A method of making a perforate glass plate comprising the steps of: heating and drawing a first glass rod and a surrounding first glass tube to a smaller diameter, said first glass tube having a given thermal expansion coefficient; cutting said drawn first rod and tube into equal lengths; packing a hexagon mold full of said rod and tube lengths with said rod and tube lengths parallel; heating said mold to tack said tubes together; heating and drawing said tacked tubes and rods to a smaller size hexagon; cutting said smaller hexagon into equal lengths; placing said hexagon lengths in parallel positions inside a second glass tube; heating and evacuating said second glass tube to force it into contact with and fuse with said hexagon lengths to make a first boule; grinding off said second tube to make said first boule have a cylindrical surface; inserting said ground first boule into a third glass tube having a larger thermal expansion coefficient than said first tube; heating said ground first boule and said third tube and evacuating said third tube to force it into contact with said ground first boule and cause said ground first boule and said third glass tube to fuse together to make a second boule; slicing said second boule in a plane transverse to its axis to produce a thin wafer; removing said rod glass from said wafer by etching to form a plurality of holes therethrough; and heating said etched wafer in a hydrogen atmosphere so that said third glass tube remains fused to said wafer.

4,101,304
METHOD AND APPARATUS FOR FEEDING GLASS OUT OF A MELTING TANK TO A FLAT GLASS FORMING MEANS

Jean Marchand, Alsemberg, Belgium, assignor to BFG Glassgroup, Paris, France

Filed Mar. 28, 1977, Ser. No. 782,089
Claims priority, application United Kingdom, Apr. 12, 1976, 14844/76
Int. Cl.[2] C03B 5/04
U.S. Cl. 65—135 19 Claims



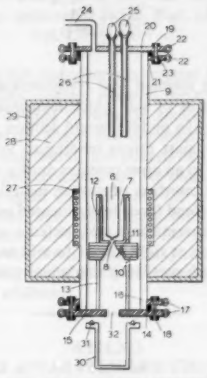
1. In apparatus for the manufacture of flat glass including a glass melting furnace having a sole and an outlet end from which molten glass flows out of the furnace, and means defining an exit channel having a sole and disposed adjacent the furnace to receive molten glass from the furnace outlet end and to deliver the molten glass to forming apparatus, the width of the exit channel being less than that of the furnace, the improvement wherein at least a portion of said sole of said furnace, adjacent the outlet and thereof and over substantially the full width thereof, is inclined upwardly at an angle of about 2° to b 5° from the bottom of said furnace continuously towards said sole of said exit channel.

16. In a method of manufacturing flat glass by feeding molten glass from the outlet end of a glass melting furnace via a forehearth to a narrower exit channel and conducting the glass to flat glass forming apparatus, the improvement wherein said step of feeding comprises causing glass to flow, in the forehearth, over a sole which is inclined upwardly at an angle of about 2° to 5° over substantially the full width of the forehearth toward the exit channel.

4,101,305
DRAWING DIELECTRIC OPTICAL WAVEGUIDES

John Edwin Midwinter, Suffolk, and Clive Richard Day, London, both of England, assignors to The Post Office, London, England

Division of Ser. No. 591,958, Jun. 30, 1975, Pat. No. 4,040,807.
This application May 25, 1977, Ser. No. 800,429
Claims priority, application United Kingdom, Jul. 10, 1974, 30525/74
Int. Cl.[2] C03B 5/32, 5/20
U.S. Cl. 65—145 6 Claims



1. Apparatus for drawing dielectric optical waveguides comprising:
a container;
a double crucible assembly within said container, having inner and outer compartments;
means for hermetically sealing said container;
means for heating said double crucible;
guide means comprising a pair of tubes extending vertically into said container for inhibiting lateral movement of glass rods to be loaded into the compartments of said double crucible, thereby insuring that rods are substantially at 90° to the melt surface in said compartments; and
means defining a gas inlet into said container.

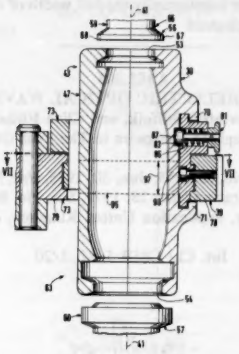
4,101,306
MOULDING TOOL

Lothar Schaar, Heuerssen, Fed. Rep. of Germany, assignor to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,603
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609651
Int. Cl.[2] C03B 9/40, 9/00
U.S. Cl. 65—323 17 Claims

1. In a moulding tool for a machine for moulding plastic material, especially molten glass, a combination comprising at least one middle mould section having a longitudinal axis and

being divided into a plurality of cooperating middle mould section parts; a pair of axially spaced guide elements for each of said middle mould section parts, each of said pair of guide elements being connected to the respective middle mould section part and having a surface normal to said longitudinal axis and facing a corresponding surface of the other of said guide elements, at least one of said guide elements which is located above the other guide element of each pair being hook shaped; and operating means having means for supporting each of said middle section mould parts with radial clearance in said



hook-shaped guide element and transmission means located between said surfaces of said guide elements for applying a force to the respective middle mould section part for holding the latter closed against forces tending to move said middle mould section part to an open position during operation of said moulding tool and insertion of molten material thereinto, the resultant holding closed force being located substantially in an application plane intermediate said surfaces of said guide elements and extending at right angles to said axis and the resultant of said opening forces lying also substantially in said plane.

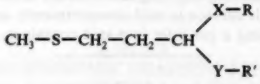
4,101,307

METHIONAL DERIVATIVES AND COMPOSITIONS WITH A GROWTH-REGULATING EFFECT UPON PLANTS

Claude Clapot, Oullins; Louis Dumont, Chaponost, and Jean Vial, Tassin la Demi-Lune, all of France, assignors to Philagro S.A., Lyon, France

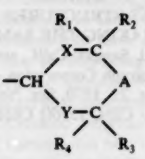
Filed Jul. 14, 1975, Ser. No. 595,723
Claims priority, application France, Jul. 15, 1974, 74 25781
Int. Cl.[2] A01N *9/00*
U.S. Cl. 71—88 **6 Claims**

1. A compound corresponding to the general formula



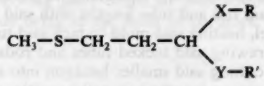
in which
X and Y are oxygen,
R and R′ form with

a cycle corresponding to to the formula



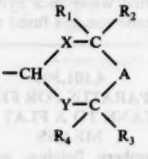
in which
R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, an optionally halogen-substituted alkyl radical containing from 1 to 4 carbon atoms, the radicals NO_2, hydroxy and alkoxy containing from 1 to 4 carbon atoms, and
A represents a single bond with the proviso that R_1, R_2, R_3, R_4 do not represent hydrogen.

2. A growth-regulating composition for plants, comprising (1) an agricultural carrier, (2) a surfactant and (3) an amount sufficient to regulate the growth of plants of a compound corresponding to the general formula



in which
X and Y are oxygen,
R and R′ form with

a cycle corresponding to the formula



in which
R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, an alkyl radical containing from 1 to 4 carbon atoms and optionally substituted by a halogen, the radicals NO_2, hydroxy and alkoxy containing from 1 to 4 carbon atoms,
is a single bond.

6. A process for modifying the growth of a plant comprising to said plant a growth modifying amount of a compound in accordance with claim **1**.

4,101,308

SELECTIVE HERBICIDE

Oscar Rene Ochomogo, Baton Rouge, La., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 699,303, Jun. 24, 1976, abandoned.
This application Sep. 26, 1977, Ser. No. 836,750
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—93 **9 Claims**

1. Method for preventing and controlling undesired vegetation in the locus of oil palm, rubber, coffee and tea crops without causing significant injury to said crops comprising applying to the locus of said crops an effective amount of

1-methyl-3-cyclohexyl-6-dimethylamino-s-triazine-2,4(1H,3H)-dione.

4,101,309

METHOD FOR PREPARING TUNGSTEN MATERIALS

Isamu Koseki, Yokohama, and Motoo Seimiya, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 13, 1976, Ser. No. 732,073
Int. Cl.[2] B22F *1/00*; C22B *34/36*
U.S. Cl. 75—0.5 AB 5 Claims

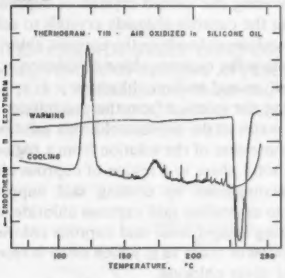
1. In a method for preparing a tungsten material comprising the steps of reducing tungsten oxides having doping agents added thereto, washing the resulting tungsten powder with an acid, and thereafter drying the washed tungsten powder, the improvement comprising conducting said washing step separately with hydrochloric acid and then with hydrofluoric acid by first washing said tungsten powder with hydrochloric acid having a concentration of not less than 4% by weight and thereafter washing with hydrofluoric acid having a concentration of not less than 3% by weight.

4,101,310

MICRON SIZED SPHERICAL DROPLETS OF METALS AND METHOD

Don H. Rasmussen, and Carl R. Loper, Jr., both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 560,478, Mar. 20, 1975, Pat. No. 4,042,374.
This application Feb. 4, 1977, Ser. No. 765,538
Int. Cl.[2] B22F *9/00*
U.S. Cl. 75—0.5 B 11 Claims



Thermogram for pure tin. Emulsion formed by air oxidation in silicone oil. Melting point, 232°C. Thermogram peak crystallization temperature, 154°C. Peak supercooling, 100 degrees. Supercooling range, 30 degrees.

1. A method for processing a material formed of at least two components, at least one of which tends to cluster when the material is reduced to micron sized particles from a molten state, comprising heating the material to a molten state, reducing the molten material to micron sized particles in the presence of a reactant which forms a reaction product on the surfaces of the formed molten micron sized particles to inhibit their agglomeration whereby as a result of nonstatistical separation, some of the micron sized particles contain a concentration of one component which is higher than the concentration of that component in the original material, while other micron sized particles contain a concentration of the one component which is less than the concentration in the original material, solidifying at least a portion of the micron sized particles in response to decrease in temperature, and then separating the particles based upon differences in physical and chemical properties.

4,101,311

PROCESS FOR PRODUCING FERROMAGNETIC METAL POWDER

Masashi Aonuma; Yasuo Tamai, and Fumio Kodama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara

Filed Aug. 1, 1977, Ser. No. 820,951
Int. Cl.[2] H01F *1/06*
U.S. Cl. 75—0.5 17 Claims

1. A process for producing a ferromagnetic metal powder comprising:

(a) adding a reducing agent to an aqueous solution of a salt of Fe, Co, Fe-Co, Fe-Ni, Co-Ni or Fe-Co-Ni at a rate of 0.1 to about 100 mole/sec. over an addition time of one minute or less, the temperature of said salt solution being −10° to 40° C at the start of said addition, and

(b) during the course of the reduction maintaining the temperature of said aqueous solution at a temperature not more than about 20° C higher than the temperature of said salt solution at the start of the addition.

4,101,312

METHOD FOR OPERATION OF A CONVERTER

Yozo Takemura, Chita; Shigeyoshi Fukuda, and Sadashi Ogino, both of Tokai, all of Demo. Peoples Rep. of Korea, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 1, 1976, Ser. No. 701,943
Claims priority, application Japan, Nov. 14, 1975, 50-137033
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—52 3 Claims

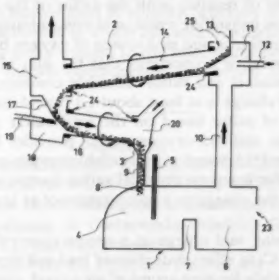
1. In a method for operating a converter for the refining of steel under dynamic control wherein the steel is blown with oxygen and the oxygen blowing is accurately stopped at a predetermined temperature, and immediately thereafter, the molten steel and slag therein are poured out, the improvement which comprises adding from 8 to 25% based on the amount of slag of a cooling agent selected from the group consisting of burntlime, dolomite, lime stone, scrap bricks, converter slag, and baked dolomite, to the slag in the converter within 1 minute after the shutdown of the oxygen blowing and then starting the pouring-out of the steel from the converter within 2 minutes of the addition.

4,101,313

PROCESS AND APPARATUS FOR THE PRODUCTION OF STEEL

Pierre Vayssiere, and Aristide Berthet, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), St. Germain-en-Laye, France

Filed Oct. 14, 1976, Ser. No. 732,362
Claims priority, application France, Oct. 14, 1975, 75 31335
Int. Cl.[2] C21C *5/38*, *5/40*
U.S. Cl. 75—60 5 Claims



1. A process for the production of steel from a carburized metallic charge comprising solid materials rich in iron, which comprises

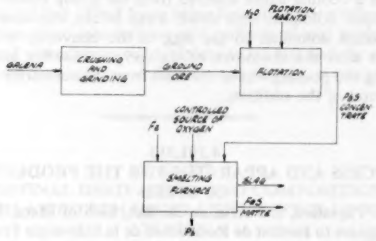
(a) subjecting the charge to a two-phase preheating below the melting temperature of the solid materials,
(1) the cold charge being received in a first preheating phase and
(2) the charge whose temperature has been raised in the first preheating phase being received in a second, separate and succeeding preheating phase,
(b) introducing the preheated charge from the two-phase preheating into a melting and refining vessel,
(c) melting and refining the preheated charge in the vessel by subjecting the charge to a melting temperature and refining agents whereby hot gases develop in the vessel
(d) recovering the hot gases,
(e) delivering the recovered hot gases to the first preheating phase where the hot gases and the cold charges are in contact until the temperature of the charge has been raised, the hot gases and the charge being moved simultaneously in the first preheating phase, and
(f) supplying hot combustion gases from the outside to the second preheating phase while the charge is moved therethrough until the final temperature of the charge has been adjusted to a desired value, the charge having a temperature of the desired value being introduced from the second preheating phase into the vessel.

4,101,314

PROCESS FOR RECOVERY OF LEAD FROM LEAD SULFIDE CONCENTRATES

Arthur E. Morris, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 674,836, Apr. 8, 1976, abandoned, which is a continuation of Ser. No. 575,354, May 7, 1975, abandoned. This application May 18, 1977, Ser. No. 797,936
Int. Cl.[2] C22B *13/00*
U.S. Cl. 75—77 **6 Claims**



1. A process for recovery of lead from a lead sulfide concentrate comprising the steps of:

preparing a furnace charge comprising said concentrate, a source of elemental iron, and a source of available oxygen capable of reacting with the sulfur of the concentrate to form an oxysulfide matte, said concentrate, said source of elemental iron and said source of oxygen being present in such relative proportions that the sum of the elemental iron content and sulfur-reducible combined iron content of the charge is at least about 1.1 pound atoms per pound atom of sulfur based on the total sulfur content of the charge, and the oxygen source provides between about 0.25 and 0.5 pound atom available oxygen per pound atom of sulfur based on the total sulfur content of the charge;

heating the charge to a temperature of at least about 1050° C.;

maintaining said charge at a temperature of at least about 1050° C. to effect reduction of lead sulfide with elemental iron while limiting access of air to said charge to substantially prevent formation of sulfur dioxide therein, thereby causing formation of elemental lead and a matte containing partially oxygenated iron sulfide without substantial evolution of sulfur dioxide; and

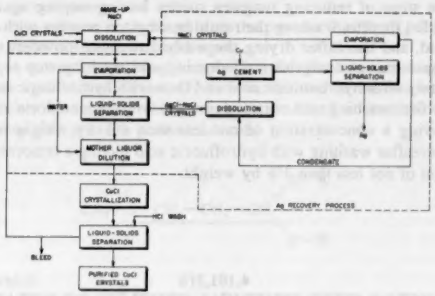
separating said elemental lead from said matte.

4,101,315

RECOVERY OF SILVER FROM CUPROUS CHLORIDE SOLUTIONS BY CO-CRYSTALLIZATION WITH SODIUM CHLORIDE

Mark A. Peters, Arvada, and Robert K. Johnson, Lakewood, both of Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed Jan. 17, 1977, Ser. No. 759,846
Int. Cl.[2] C22B *15/12, 11/04;* C01G *5/00*
U.S. Cl. 75—104 **13 Claims**



10. A process for recovering substantially silver and iron free copper from copper ores containing silver and iron which comprises:

(a) reducing the copper in the ore to the cuprous form by leaching the ore with ferric chloride and cupric chloride to form a leach liquor containing the cuprous chloride;
(b) crystallizing the cuprous chloride from the leach liquor and recovering the formed crystals of cuprous chloride;
(c) reducing the cuprous chloride crystals to solution;
(d) adding sodium chloride to the cuprous chloride solution;
(e) evaporating the cuprous chloride solution to co-crystallize the silver and sodium chlorides;
(f) separating the solution from the precipitated chlorides;
(g) adding water to the cuprous chloride solution to change the concentration of the solution from a region of sodium chloride solid phase to a region of cuprous chloride solid phase accompanied by cooling said cuprous chloride solution to crystallize said cuprous chloride, and
(h) recovering copper from said cuprous chloride crystals.

11. The process of claim **10** in which silver is recovered from the recovered silver chloride.

4,101,316

CONVERSION OF MOLYBDENITE CONCENTRATE TO FERRO-MOLYBDENUM AND SIMULTANEOUS REMOVAL OF IMPURITIES BY DIRECT REDUCTION WITH SULFIDE FORMING REDUCING AGENTS

Jan Wallén, Trollhattan, Sweden, assignor to Ferrolegeringar Trollhatteverken AB, Trollhattan, Sweden

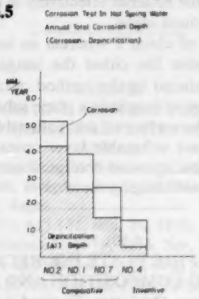
Filed Apr. 8, 1977, Ser. No. 786,013
Claims priority, application Sweden, Apr. 14, 1976, 76044437
Int. Cl.[2] C22C *1/02*
U.S. Cl. 75—129 **8 Claims**

1. A process for reducing copper-containing molybdenite concentrates comprising effecting the reduction of the molybdenite concentrate in one of a ferro-manganese melt and a melt of ferro-manganese and iron thereby to form a manganese - sulfur - and copper bearing slag phase and a metal phase containing molybdenum and iron.

4,101,317
COPPER ALLOYS WITH IMPROVED CORROSION RESISTANCE AND MACHINABILITY

Masao Okano, Suwa, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 399,603, Sep. 21, 1973, abandoned. This application Jan. 24, 1977, Ser. No. 761,890
Claims priority, application Japan, Oct. 3, 1972, 47-99408
Int. Cl.[2] C22C *9/04*
U.S. Cl. 75—156.5 6 Claims



1. Copper-base alloy having improved corrosion resistance and machinability, consisting essentially of

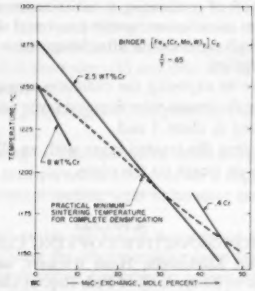
63.0–66.0 wt. % copper,
1.2–2.0 wt. % tin,
1.0–2.0 wt. % lead,
0.1–1.0 wt. % iron,
2.0 wt. % or less nickel,
0.1 wt. % or less beryllium,

with the balance being zinc and unavoidable impurities, said alloy having been subjected to conventional hot and cold working and thereafter subjected to a heat treatment in the range from about 350 to 550° C for about 1 to 10 hours.

4,101,318
CEMENTED CARBIDE-STEEL COMPOSITES FOR EARTHMOVING AND MINING APPLICATIONS

Erwin Rudy, 1575 NW. Oakhill Dr., Beaverton, Oreg. 97005

Filed Dec. 10, 1976, Ser. No. 749,343
Int. Cl.[2] C22C *29/00;* B22F *3/00*
U.S. Cl. 75—240 13 Claims



1. A heat treatable composite structure comprising a heat treatable cemented carbide component and a heat treatable steel component;

the cemented carbide component comprising a sintered component including grains of monocarbide based substantially on the hexagonal solid solution (Mo,W)C embedded in a binder of heat treatable steel alloy, the binder being from 30 to 80 percent by volume of the cemented carbide component;

the steel component being formed from a castable low alloy steel;

the cemented carbide component being joined to the steel component by being integrally cast into the steel component, the cemented carbide component thereby being diffusion bonded to the steel component and being prestressed in compression.

6. A composition of material comprising sintered carbide-binder metal alloys in which the carbide comprises grains of monocarbide based substantially on the hexagonal solid solution (Mo,W)C embedded in a binder of heat treatable steel alloy which contains between 0.40 and 8.0 percent by weight chromium, between 0.40 and 8.0 percent by weight of a metal selected from the group consisting of molybdenum and tungsten, less than 1.5 percent by weight vanadium and between 0.15 and 1.20 percent by weight carbon, with the binder metal being from 30 to 80 percent by volume of the composition of material.

13. The method of making a heat treatable composite structure comprising a heat treatable cemented carbide component and a heat treatable steel component in which the cemented carbide component comprises grains of monocarbide based substantially on a preselected hexagonal solid solution (Mo,W)C embedded in a binder of heat treatable steel alloy which contains between 0.40 and 8.0 percent by weight chromium between 0.40 and 8.0 percent by weight of a metal selected from the group consisting of molybdenum and tungsten less than 1.5 percent by weight vanadium and between 0.15 and 1.20 percent by weight carbon, with the binder metal being from 30 to 80 percent by volume of the composition of material, and in which the steel component is formed from a castable low alloy steel, which method comprises the steps of:

preparing a powder mixture of binder and carbides having the desired gross composition of the cemented carbide component in which the binder portion of the powder mixture comprises iron powder whose average diameter is less than 40 micrometers alloyed with up to 10 percent by weight other iron group elements and not more than 0.2 percent by weight vanadium and 1.5 percent by weight chromium, with any additional chromium and vanadium being added to the powder mixture as carbides and with molybdenum and tungsten components of the binder being added as elemental powders or carbides,

wet milling the powder mixture to increase the sintering activity of the iron powder,

drying and homogenizing the powder mixture,

pressing the powder mixture into a compact having a predetermined shape,

sintering the compact to substantially full density at sintering temperatures not higher than the temperature at which η-carbides are formed for the preselected solid solution (Mo,W)C,

placing the sintered compact in a predetermined location of a casting mold,

pouring molten low alloy steel into the mold, and

allowing the molten steel to solidify, whereby a composite structure is formed in which the cemented carbide component is integrally bonded to the steel component and the cemented carbide component is prestressed in compression.

4,101,319
PLASMA DEPOSITION WELDING POWDER FOR PRODUCING WEAR RESISTANT LAYERS

Horst Beyer, and Ulrich Buran, both of Burscheid, Fed. Rep. of Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 687,661
Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522690
Int. Cl.[2] B32B *15/16;* B22F *1/00*
U.S. Cl. 75—252 16 Claims

1. Plasma deposition welding powder for the production of

wear-resistant layers or machine parts subject to friction, consists essentially of a powder mixture of two components A and B, of which component A is present at about 70 to 99.5 weight percent of the total of A and B, component A comprising at least one metal selected from the group consisting of molybdenum and tungsten, component B being present at about 0.5 to 30 weight percent of the total of A and B, and consisting essentially of at least one alloy or compound of at least one of the metals selected from the group consisting of cobalt, chromium, iron, nickel, copper and manganese, with at least phosphorus.

4,101,320
MAGNETIC IMAGING METHOD

Edward C. Sellers, Buffalo, and Chandler Malkani, Tonawanda, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1974, Ser. No. 537,230
Int. Cl.[2] G03G *13/22, 19/00, 13/26*
U.S. Cl. 96—1.4 **10 Claims**

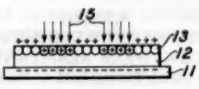
ORIGINAL IMAGE
DEVELOP GRAPHIC IMAGE OF ORIGINAL
MAGNETIZE MAGNETIC SURFACE PER GRAPHIC IMAGE
POLISH REDEVELOPED GRAPHIC IMAGE
MAGNETIZE MAGNETIC SURFACE PER GRAPHIC IMAGE
UTILIZE MAGNETIZED SURFACE

1. An imaging method which comprises the steps of:
(a) forming a grahic image with magnetizable marking materials;
(b) magnetizing said graphic image;
(c) further developing said graphic image by depositing magnetically attractable marking material on said magnetized image, without having previously fused said graphic image;
(d) fixing said redeveloped image to a substrate; and,
(e) subsequently polishing said fixed, redeveloped image and utilizing said redeveloped image to provide a latent magnetic image in a magnetic surface without transferring said redeveloped image to said magnetic surface.

4,101,321
IMAGING SYSTEM

Mortimer Levy, Rochester, and William L. Goffe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 612,122, Jan. 27, 1967, abandoned. This application Sep. 14, 1970, Ser. No. 71,781
Int. Cl.[2] G03G *5/04*
U.S. Cl. 96—1.5 R **62 Claims**



1. An imaging method comprising:
providing a member comprising a layer of softenable material and agglomerable material both of which are capable of being softened by at least one of contact by solvent vapors below, heating below or combinations thereof, said agglomerable material distributed in depth in said softenable material in a first image configuration and comprising in addition to said first image pattern of agglomerable material, a complementary background pattern comprising agglomerable material in said softenable material, at least in part spaced apart in depth in said softenable material from said first image pattern, and
heating said member simultaneously with or after contacting said member with solvent vapors sufficiently to substantially reduce the effective optical cross-sectional area of the agglomerable material selectively in either said image or said background areas.

49. The method of claim 1 wherein an imaged migration-type imaging member has either the image or background areas selectively reduced by the method of claim 1, and
said imaging member is split in a plane substantially parallel and between the surface of said softenable layer whereby a portion of said softenable layer containing either said image or said background configuration is split from the remainder of said imaging member.

4,101,322
LITHOGRAPHIC PLATE INK RECEPTIVITY IMPROVING COMPOSITION AND METHOD

Leslie Edward Lawson, Orpington, England, assignor to Vickers Limited, London, England

Filed Jan. 24, 1977, Ser. No. 761,997
Claims priority, application United Kingdom, Jan. 26, 1976, 2951/76
Int. Cl.[2] G03F *7/02*
U.S. Cl. 96—33 **12 Claims**

1. A composition for improving the ink receptivity of a lithographic printing plate having a printing image formed by alkali-development of an image-wise exposed radiation sensitive layer which composition comprises
(i) an organic solvent liquid capable of softening the surface of the printing image, said solvent being selected from the group consisting of alcohols, esters and ketones and comprising from about 2% to 20% by weight of the composition and
(ii) a film forming alkali-resistant oleophilic material which is a liquid hydrocarbon solution of a normally solid material selected from the group consisting of hydrocarbons, fats and mixtures of hydrocarbons and fats, said liquid hydrocarbon comprising from about 45% to 85% by weight of the composition and said normally solid material comprising from about 5% to 25% by weight of the composition.

6. A method of processing a radiation sensitive plate comprising a layer of radiation sensitive material which is developable by an alkaline developer after image-wise exposure, which method comprises:
(a) image-wise exposing the radiation sensitive layer,
(b) treating the image-wise exposed layer with a composition as claimed in claim 1 and
(c) developing the treated layer with an alkaline developer to leave an image on the plate.

4,101,323
RADIATION-SENSITIVE COPYING COMPOSITION

Gerhard Buhr, Königstein; Hans Ruckert, and Hans Werner Frass, both of Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 669,892
Claims priority, application Switzerland, Mar. 27, 1975, 3953/75
Int. Cl.[2] G03C *5/00, 1/52, 1/00*
U.S. Cl. 96—35 **16 Claims**

16. In the process for recording high-energy radiation which comprises
(a) imagewise irradiating a radiation-sensitive recording material composed of a support and a radiation-sensitive layer in such doses that the solubility of the layer, espe-

cially in water and aqueous solution, increases in the irradiated areas, and

(b) removing the irradiated areas with a liquid developer,

the improvement wherein said layer comprises a compound (1) which splits-off acid during irradiation, and a compound (2) which contains at least one group selected from the group consisting of a carboxylic ortho acid ester group and a carboxylic acid amide acetal group.

4,101,324

PRINTING PLATE AND METHOD FOR FORMING THE SAME HAVING SMALL PROJECTIONS IN NON-IMAGE AREAS

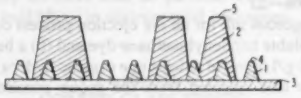
Masayoshi Mizuno; Tadashi Kawamoto, and Kiichi Iida, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 617,131, Sep. 26, 1975, Pat. No. 4,046,071. This application Nov. 17, 1976, Ser. No. 742,477

Claims priority, application Japan, Sep. 26, 1974, 49-110001; Mar. 31, 1975, 50-37775; Apr. 28, 1975, 50-50775; May 22, 1975, 50-60167

Int. Cl.² G03C *1/68*

U.S. Cl. 96—36.3 **9 Claims**



1. A method for making a printing plate precursor which comprises.

(a) superimposing a photosensitive resin layer having thickness of transparent or 0.06 mm on a support, which is at least semitransparent to actinic light, in intimate contact therewith;

(b) exposing the resulting assembly to actinic light through an image-bearing transparency from the side of the photosensitive resin layer opposite the support;

(c) exposing the assembly to actinic light through a dot-image-bearing transparency having a transparent halftone dot area in a proportion of 1 to 40% from the side of the support to thereby form reliefs on the support as image areas and a number of small projections having a height of at least 0.01 mm., and being lower than the height of reliefs, in non-image areas, wherein steps (b) and (c) may be conducted in the order: (b) and then (c); or (c) and then (b); or simultaneously.

8. A method for preparing a novel printing plate precursor which comprises:

(a) superimposing a photosensitive resin layer having a thickness of transparent or 0.06 mm on a support at least semi-transparent to actinic light in intimate contact therewith;

(b) exposing the entire surface of the support to an extent that does not cure the photosensitive resin layer;

(c) exposing the resulting assembly to actinic light through an image-bearing transparency from the side of the photosensitive resin layer opposite the support;

(d) exposing the resulting assembly to actinic light through a dot-image-bearing transparency having a transparent halftone dot area in a proportion of 1 to 40% from the side of the support to thereby form on the base plate reliefs as an image area and a number of minute points having a height of at least 0.01 mm, and being lower than the height of the reliefs, in a non-image area, wherein steps (c) and (d) may be conducted in the order; (c) and then (d); or (d) and then (c); or simultaneously.

4,101,325

CONDUIT AND METHOD FOR PROCESSING WEBS WITH A LIQUID SOLUTION

Robert F. Allen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 490,155, Jul. 19, 1974, Pat. No. 3,968,510, which is a continuation of Ser. No. 375,576, Jul. 2, 1973, abandoned. This application Apr. 16, 1976, Ser. No. 677,633

Int. Cl.² G03C *5/24, 5/26*

U.S. Cl. 96—48 R **5 Claims**

1. A method for processing an imagewise exposed photographic web with a liquid processing solution supplied through a processing conduit having pores between the inner and outer surfaces of the conduit at least along a helical path; said method comprising the steps of:

flowing processing liquid into the conduit and at least a portion thereof through said pores;

forming an elongate cushion of the liquid processing solution on the outer surface of the conduit at least along said helical path for supporting a section of the web along said helical path and;

guiding a web around said conduit in the helical path with one surface of said web in engagement with said liquid cushion for processing said web.

4,101,326

PROCESS FOR MAKING STABILIZED POLYESTERS USED IN RADIATION-SENSITIVE COMPOSITIONS FOR LITHOGRAPHIC PLATES HAVING IMPROVED WEAR LIFE INCLUDING HINDERED PHENOLS AND PHOSPHORIC ACID ESTERS

Kenneth T. Barkey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 656,508, Feb. 9, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,942

Int. Cl.² G03C *1/68*

U.S. Cl. 96—67 **18 Claims**

1. A radiation-sensitive element comprising a support having thereon a coating which comprises:

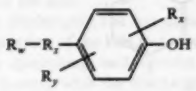
a radiation-sensitive condensation polyester formed from

1) at least one diol; and

2) at least one diacid or a functional derivative thereof containing at least one non-aromatic ethylenic-bond-containing group which is capable of crosslinking upon exposure to actinic radiation and has the formula

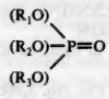
wherein R_z is an unsubstituted or substituted aliphatic or cycloaliphatic hydrocarbon group having 2 to 7 carbon atoms and a crosslinkable ethylenic bond; said condensation polyester being formed in the presence of a combination of:

(a) at least one hindered phenol having the formula:



wherein R_w is a functional group capable of participating in ester interchange and polycodensation reactions that occur during formation of said condensation polyester, R_x and R_y are alpha-branched alkyl radicals containing 3–20 carbon atoms, alpha-branched aralkyl radicals containing 7–20 carbon atoms, or cycloalkyl radicals containing 6–20 carbon atoms and R_z is a divalent hydrocarbon radical containing from 1 to 3 carbon atoms; and

(b) at least one phosphoric acid ester having the formula



wherein each of R_1, R_2 and R_3 is a hydrocarbon radical having from 6 to 8 carbon atoms, said R_1O, R_2O and R_3O groups being capable of participating in ester interchange and polycondensation reactions that occur during the formation of said condensation polyester,

said phosphoric acid ester (b) and hindered phenol (a) being present in said combination in a molar ratio which provides

and phenolic hydroxy groups in a ratio in the range of from 1:1 to 1:6, respectively, said (a) and (b) compounds being thermally stable and substantially non-volatile at temperatures in the range of from about 250° to about 300° C; and

said radiation-sensitive condensation polyester having an inherent viscosity of from about 0.2 to about 1.0 and a polydispersity ratio of from about 1.8 to 3.4.

4,101,327

LIGHT-SENSITIVE COPYING COMPOSITIONS AND PHOTOINITIATORS CONTAINED THEREIN

Werner Frass, Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

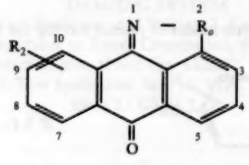
Filed Dec. 23, 1976, Ser. No. 753,875

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558812

Int. Cl.² G03C *1/68*

U.S. Cl. 96—115 P **13 Claims**

1. A light-sensitive copying composition which contains about 15 to 98.4% by weight of at least one polymeric binder, about 1 to 75% by weight of at least one ethylenically-unsaturated polymerizable compound, and about 0.1 to 10% by weight of at least one polynuclear heterocyclic nitrogen compound as a photoinitiator having the general formula II



II

wherein R_o is O, S, or NR_1 and R_1 is hydrogen, a saturated or unsaturated unsubstituted alkyl group with 1 - 6 carbon atoms, a saturated or unsaturated alkyl group with 1 - 6 carbon atoms which is substituted by hydroxyl, alkoxy, alkoxycarbonyl, acyl, acyloxy and/or halogen, an aralkyl group with 7 - 10 carbon atoms, an acyl group with 2 - 18 carbon atoms or a polyalkyleneoxide group of the general formulae $-(C_a-H_{2a}-O)_n-C_a-H_{2a}-OH$ or $-(C_aH_{2a}-O)_n-C_aH_{2a}-OCH_3$ wherein $a = 2$ to 4 and $n = 1$ to 10, and R_2 is hydrogen, an alkoxy group, an alkyl group with 1 - 6 carbon atoms or halogen.

4,101,328

WHITE RUST INHIBITOR

Arthur H. Fieser, Wexford, and Donald C. Finney, Bellevue, both of Pa., assignors to A. F. Industries, Inc., Pittsburgh, Pa.

Filed Jul. 9, 1976, Ser. No. 703,848

Int. Cl.² C09D *5/08*

U.S. Cl. 428—624 **4 Claims**

1. In a combination including a zinc surfaced steel substrate susceptible to white rust and an amine-acid salt corrosion inhibiting composition in contact with the substrate, the improvement comprising:

an effective amount of a pH adjusting amine, having a pK of less than 5, to adjust the effective pH of said corrosion inhibiting composition at 8 to 12.5

4,101,329

AQUEOUS INK FOR AN INK EJECTION PROCESS

Ehrenfried Loock, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Mar. 16, 1976, Ser. No. 667,378

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2511902

Int. Cl.² C09D *11/00, 11/02*

U.S. Cl. 106—22 **7 Claims**

1. An aqueous ink for an ink ejection process comprises: (a) a water soluble triphenyl methane dye and (b) a buffer mixture of 5 to 200 g/l of ink of at least one organic hydroxy-containing carboxylic acid selected from the group consisting of citric acid, malic acid, gluconic acid and tartaric acid and 5 to 200 g/l of ink of at least one water soluble amine selected from the group consisting of diethanolamine, ethanolamine, ethylenediamine and triethanolamine.

4,101,330

LEUCITE-CONTAINING PORCELAINS AND METHOD OF MAKING SAME

Bruce Burk, Windsor, Conn., and Arthur P. Burnett, Milford, Del., assignors to The J. M. Ney Company, Bloomfield, Conn.

Filed Sep. 1, 1976, Ser. No. 719,380

Int. Cl.² C04B *35/14, 33/00, 33/24*

U.S. Cl. 106—45 **25 Claims**

1. A ceramic raw material consisting essentially of at least about 78.1 percent by weight nepheline syenite, about 3 to 7 percent by weight of pre-formed leucite particles and about 0 to 15.5 percent by weight of at least one modifier selected from the class consisting of oxides and oxide precursors of potassium, sodium and lithium.

4,101,331

HALIDE OPTICAL ELEMENTS

Rogers H. Anderson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 671,192, Mar. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,290, Feb. 28, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,869

Int. Cl.² C04B *35/00, 11/22*

U.S. Cl. 106—73.1 **6 Claims**

1. An infrared transparent optical element comprising a crack-free, fully-dense alkaline earth fluoride body having a fine-grained crystalline structure throughout and having a grain size range of less than about 20μm.

4,101,332
STABILIZED MIXTURE
John Patrick Nicholson, Toledo, Ohio, assignor to Nicholson Realty Ltd., Sylvania, Ohio
Division of Ser. No. 654,211, Feb. 2, 1976, Pat. No. 4,018,617.
This application Feb. 4, 1977, Ser. No. 765,837
Int. Cl.[2] C04B 7/26
U.S. Cl. 106—85 8 Claims

1. A mixture consisting essentially of fly ash and cement kiln dust.

4,101,333
METHOD OF MINE BACKFILLING AND MATERIAL THEREFOR
William Ross Wayment, Kitchener, Canada, assignor to Joy Manufacturing Company, Pittsburgh, Pa.
Division of Ser. No. 716,617, Aug. 19, 1976, Pat. No. 4,059,963.
This application May 23, 1977, Ser. No. 799,422
Int. Cl.[2] C04B 7/00, 7/02
U.S. Cl. 106—85 2 Claims

1. A structural material derived from a slurry of mill tailings and water with the water content being in the range of 35 to 70 percent by weight consisting of centrifugally dewatered, unclassified mill tailings of substantially uniform composition having a water content no greater than 25 percent by weight and preferably no more than 20 percent, which can be used directly for backfilling in underground operations.

4,101,334
COATED GLASS FIBERS
Homer G. Hill, Newark, and William G. Pansius, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Dec. 23, 1976, Ser. No. 753,746
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—99 23 Claims

1. A cementitious product comprising a composite of reinforcing materials and a cementitious matrix wherein one of the reinforcing materials comprising bundles formed of a plurality of alkali resistant glass fibers, said bundles including an alkali impervious impregnant which coats the glass fibers and penetrates the bundles to fill the interstices between the glass fibers separating each from the other.

4,101,335
BUILDING BOARD
Victor Ernest Barrable, Gerrards Cross, England, assignor to Cape Boards & Panels Ltd., Uxbridge, England
Continuation-in-part of Ser. No. 738,688, Nov. 4, 1976, which is a continuation of Ser. No. 538,197, Jan. 2, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,676
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—99 38 Claims

1. A shaped article having low shrinkage characteristics when subjected to high temperatures in the order of at least 900° C, which comprises:

a binder which has been caused to set by the action thereon of H_2O and reinforcing fibers, said binder being present in amount of 50-99% by weight of binder and reinforcing fibers, and said reinforcing fibers including organic fibers and excluding asbestos fibers; and

a component, selected from the group consisting of mica and a mixture of mica and vermiculite, in amount of not more than 60% by weight of binder plus reinforcing fibers and component and sufficient to restrict the linear shrinkage of the article when the article is subjected to a temperature at least in the order of 900° C to a value which is significantly less than the linear shrinkage of the article in the absence of said component.

4,101,336
METHOD OF BURNING PULVEROUS ALKALI-CONTAINING RAW MATERIALS AND KILN PLANT THEREFOR
Jørn Touborg, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.
Filed Jan. 11, 1977, Ser. No. 758,428
Claims priority, application United Kingdom, Jan. 12, 1976, 962/76
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—106 8 Claims

1. A method of burning alkali-containing raw materials in a plant having a multi-string cyclone preheater, each string containing at least two cyclone preheater stages, a kiln, and a cooler unit for cooling the burnt material from the kiln by means of air which is subsequently divided into two streams, one stream being passed through the kiln and a kiln string of said preheater, the other stream being passed through a calciner and up through the calciner cyclone string of said preheater, comprising feeding raw material to each preheater string, passing the flow of material from the penultimate preheater cyclone stage of said kiln string to said calciner, passing a portion of the material from the penultimate cyclone stage of said calciner string to the lowermost cyclone stage of said kiln string, passing at least a remaining portion of the material from said penultimate cyclone stage of said calciner string to said calciner, passing material from the lowermost cyclone stage of said kiln string to said calciner, passing the at least partially calcined material from said calciner to the lowermost cyclone stage of said calciner string, and passing the material from the lowermost cyclone stage of said calciner string into said kiln for burning.

4,101,337
CEMENT MANUFACTURE
Tage Halfdan Danø, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.
Division of Ser. No. 618,819, Oct. 2, 1975, Pat. No. 4,059,396.
This application Aug. 26, 1977, Ser. No. 828,192
Claims priority, application United Kingdom, Oct. 3, 1974, 42989/74
Int. Cl.[2] C04B 7/50
U.S. Cl. 106—101 31 Claims

1. A method of manufacturing cement comprising:

(a) burning cement clinker in a kiln;

(b) contacting the hot cement clinker with a reducing agent prior to discharging said clinker from a discharge portion of the kiln;

(c) discharging the hot cement clinker from the discharge portion of the kiln to a movable clinker supporting means;

(d) quenching said cement clinker substantially simultaneously with the discharge thereof from the kiln by subjecting said clinker to a spray of cooling liquid in a manner such that a major portion of said quenching liquid evaporates substantially immediately following said quenching;

(e) transferring said cement clinker to a clinker transporting means;

(f) subjecting said cement clinker to further cooling while evaporating substantially all of the remaining cooling liquid; and

(g) producing and maintaining sub-atmospheric pressure at the location of discharge of the hot cement clinker from the kiln to thereby prevent evaporating liquid from entering the kiln.

4,101,338
PROCESS FOR RECOVERING USEFUL PRODUCTS FROM CARBOHYDRATE-CONTAINING MATERIALS

Robert M. Rapaport, New Rochelle; Anthony Monti, Irvington; Raymond D. Moroz, Staten Island, all of N.Y., and Charles B. Broeg, Short Hills, N.J., assignors to Sucrest Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 532,809, Jun. 2, 1975, abandoned. This application Apr. 27, 1976, Ser. No. 680,721
Int. Cl.² C13D *3/14, 3/00, 3/16*
U.S. Cl. 127—46 B **38 Claims**

1. In a method for treating carbohydrate-containing materials to separate carbohydrate therefrom, wherein said material is flowed through and contacted with an ion exclusion resin, the improvement comprising the steps of:
   a. contacting said resin with a first portion of said carbohydrate-containing material;
   b. thereafter sequentially contacting said resin with a second portion of said carbohydrate-containing material, said second portion having a density lower than that of said first portion;
   c. thereafter sequentially contacting said resin with dilute aqueous medium capable of eluting material adsorbed by said resin; and
   d. collecting from said resin an eluted solution, the solids of which are comprised predominantly of carbohydrate.

4,101,339
TREATMENT OF ZINC SURFACES

Hideaki Kaneko, Tokyo; Yasushi Miyazaki, Ichikawa, and Masanori Suzuki, Tokyo, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

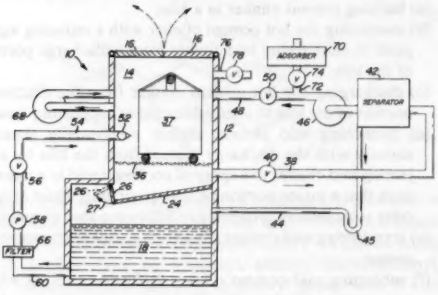
Filed Aug. 25, 1977, Ser. No. 827,660
Claims priority, application Japan, Sep. 2, 1976, 51-104249
Int. Cl.² C03C *23/00*
U.S. Cl. 134—2 **6 Claims**

1. A process for improving the corrosion resistance and paint receptivity of a zinc or zinc alloy surface comprising contacting the surface with an aqueous composition containing a thiourea compound and a vegetable tannin and exhibiting a pH value of from 2 to 6.5.

4,101,340
SOLVENT SPRAY CLEANING SYSTEM FOR MINIMIZING SOLVENT LOSSES

Burton Rand, Center Square, Pa., assignor to Autosonics, Inc., Norristown, Pa.

Continuation-in-part of Ser. No. 662,750, Mar. 1, 1976, Pat. No. 4,029,517. This application Mar. 15, 1977, Ser. No. 777,820
Int. Cl.² B08B *3/08*
U.S. Cl. 134—11 **10 Claims**

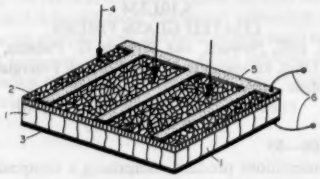


8. A method of cleaning work comprising:
(a) introducing work to be cleaned into a treating chamber of a vessel, said vessel having an unheated sump selectively communicating with the bottom of said chamber by way of a flow passage, closing the upper end of said chamber, closing said flow passage,
(b) introducing liquid solvent into said chamber by way of at least one nozzle in said chamber, said step of introducing solvent into said chamber including pumping unheated solvent from said sump to said nozzle, cleaning said work by contact with said solvent and any vapors of the solvent generated in said chamber,
(c) opening said flow passage and discharging liquid solvent from said chamber into said sump,
(d) isolating said chamber from fluid communication with said sump after said discharging step and then removing residual solvent vapors from said chamber and said work while maintaining the upper end of the chamber closed, said removing step including liquifying said vapors while creating turbulence in said chamber,
(e) opening the upper end of said chamber and then removing said work from said chamber.

4,101,341
CDSE-SNSE PHOTOVOLTAIC CELL

Matthias Peter Selders, Kronberg, Fed. Rep. of Germany, assignor to Battelle Development Corporation, Columbus, Ohio

Filed May 4, 1977, Ser. No. 793,626
Int. Cl.² H01L *31/06;* **B05D** *5/12*
U.S. Cl. 136—89 TF **7 Claims**



1. A photovoltaic cell comprising a photosensitive semiconductor junction and electrode means for withdrawing electrical energy from the semiconductor junction, wherein the semiconductor junction comprises regions of n-type cadmium selenide and p-type tin selenide.

2. The photovoltaic cell of claim 1 wherein the regions are polycrystalline.

7. A method for production of a photovoltaic cell comprising:
(a) applying to a conductive substrate a first layer of a semiconductor material selected from n-type cadmium selenide and p-type tin selenide.
(b) ion exchanging the cadmium for tin or the tin for cadmium, respectively, in an exposed surface region opposite the substrate, such that layered regions of both p-type tin selenide and n-type cadmium selenide are present, and
(c) applying an upper electrode on the exposed surface opposite the substrate.

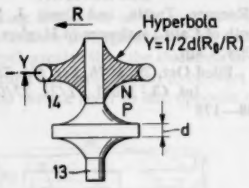
4,101,342
THERMOELECTRIC ELEMENT

Kurt Landecker, 157 Marsh St., Armidale, New South Wales, Australia (2351)

Filed Sep. 16, 1976, Ser. No. 723,890
Claims priority, application Australia, Oct. 7, 1975, 3466/75
Int. Cl.² H01V *1/02*
U.S. Cl. 136—228 **6 Claims**

4. A thermo-electric element of the kind comprising two annular dissimilar components, inner and outer electrode

means constituting a working junction and permitting current flow radially in the dissimilar components wherein at least one



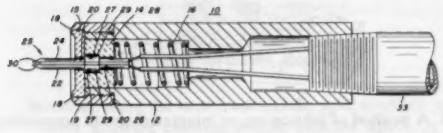
lateral face of each of the dissimilar components is non-planar and approximates a hyperboloid of revolution.

4,101,343

THERMOCOUPLE DEVICE

Lowell H. Feichter, Pittsburgh, and Albert R. Anderson, Export, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 2, 1976, Ser. No. 719,906
Int. Cl.² H01V *1/02*
U.S. Cl. 136—230 **3 Claims**



1. A two-element thermocouple device having a unitary pointed end for contacting and penetrating the surface of a metal object to be examined for its temperature, the device comprising

two, closely spaced, relatively short, dissimilar metal elements each having a narrow cross section and low mass along the length thereof, and pointed at at least one end, the two metal elements being disposed together in a manner that their pointed ends taper toward each other to form a unitary pointed end,

a relatively thin layer of heat resistant, insulating material located between the metal elements to insulate the elements from each other,

a housing, and

an insulating refractory member located within said housing, with a portion of said metal elements and insulating layer extending into and secured in said refractory member.

4,101,344

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Else Kooi; Pieter Johannes Wilhelmus Jochems, and Adrianus Teunis Van Zanten, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,896
Claims priority, application Netherlands, Oct. 25, 1976, 7611773
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **6 Claims**

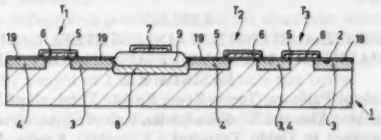
1. A method of manufacturing a semiconductor device having a semiconductor body comprising a surface and a surface-adjoining region of p-type silicon in which there are present at least two insulated gate field effect transistors whose source and drain zones are formed by n-type conductivity surface-adjoining zones, said body comprising at least a n-type conductivity further surface zone which forms a conductive connection between one of the source and drain zones of one field effect transistor and one of the source and drain zones of the other field effect transistor, said further surface zone being formed in said p-type surface region, said method comprising the steps of:

(a) positioning on said surface a doping mask which has an aperture at a predetermined area of said surface at which the surface zone is to be provided, said surface comprising a certain other area at which said the field effect transistors are to be provided, said doping mask comprising at at least said certain other area layer portions of a material masking said body against oxidation,

(b) providing atoms selected from the group As and Sb, in the semiconductor body via said aperture in the doping mask,

(c) after such provision of said atoms, removing partly said doping mask so as to obtain an oxidation mask which comprises said layer portions,

(d) then subjecting said body to an oxidation treatment so as to obtain an oxide pattern which is at least partly sunk in



the semiconductor body and which extends beside the layer portions masking against oxidation and above said predetermined area intended for the surface zone, during such oxidation treatment said atoms provided in the body at said predetermined area for the surface zone being caused to diffuse deeper into said semiconductor body and form there said n-type surface zone located below and adjoining the sunken oxide,

(e) after such oxidation treatment, providing insulated gate electrodes of said transistors at said predetermined area, where said field effect transistors are to be formed, which electrodes, viewed on the surface, are situated on either side of and at a distance from said surface zone, and

(f) providing the source and drain zones of the field effect transistors adjoining the sunken oxide pattern by doping exposed parts of said region with an impurity selected from the group P, As and Sb in a self-registering manner down to a depth at which the said zones of the field effect transistors that are to be connected together adjoin said surface zone below said sunken oxide pattern.

4,101,345

GALVANIZING STEEL STRIP IN SELECTED AREAS THEREOF

Robert F. Hunter; Stephen R. Koprich; Richard G. Baird-Kerr, all of Burlington, and Daniel S. Sakai, Toronto, all of Canada, assignors to The Steel Company of Canada, Limited, Hamilton, Canada

Filed Nov. 26, 1976, Ser. No. 745,000
Claims priority, application Canada, Nov. 5, 1976, 264969
Int. Cl.² C23C *1/02*
U.S. Cl. 148—6.15 R **6 Claims**

1. In a method of galvanizing only selected areas of a ferrous metal strip, the improvement which comprises contacting surface areas of said strip not to be galvanized with a phosphoric acid solution to cause a spontaneous reaction to form a readily chemically strippable coating of a composite comprising iron hydroxides and hydrated iron phosphates non-wetting in molten zinc on said surface areas not to be galvanized, and passing the so-treated strip through said molten zinc with the coating in contact with said molten zinc.

4,101,346

PROTECTIVE HYDROPHOBIC AND OLEOPHILIC COATING FOR ALUMINUM PRODUCTS

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 610,966, Sep. 8, 1975, Pat. No. 4,004,951, which is a continuation-in-part of Ser. No. 593,092, Jul. 3, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,026

Int. Cl.[2] C23F *7/00*

U.S. Cl. 148—6.27 **19 Claims**

1. A method of preparing a hydrophobic and oleophilic protective coating on an aluminum workpiece consisting essentially of developing a fresh aluminum surface on said workpiece and then treating the fresh aluminum surface under alkaline conditions with a liquid selected from the group consisting of nonaqueous liquids and aqueous liquids with a pH less than 10, said liquids containing an effective amount of a branched chain aliphatic carboxylic acid or an equivalent carboxylate compound having from 12 to 22 carbon atoms.

4,101,347

FERRITE-AUSTENITE STAINLESS STEEL CASTINGS HAVING AN IMPROVED EROSION-CORROSION RESISTANCE

Masakuni Fujikura; Tomio Kono; Kazuto Terai, all of Nagoya; Naohiro Abe, and Kiyohito Ishida, both of Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed May 6, 1977, Ser. No. 794,334

Int. Cl.[2] C22C *38/42*

U.S. Cl. 148—38 **1 Claim**

1. A ferrite-austenite stainless steel casting having an improved erosion-corrosion resistance, consisting by weight percentage of not more than 0.1% of carbon, 0.2–3% of silicon, not more than 2% of manganese, 2.2–4% of copper, 3–9% of nickel, 20–30% of chromium, 2–6% of molybdenum, 0.08–0.25% of nitrogen, 0.12–0.3% of tin, 0–2% of niobium, 0–1% of titanium, 0–2% of tantalum, 0–1% of zirconium, 0–5% of vanadium and remainder of iron; said stainless steel casting being obtained by solution heat treatment at a temperature of 1,000–1,150° C in such a manner that chromium-and nickel-equivalents lie within an area represented by the area ABCD shown in FIG. 1 of the accompanying drawings.

4,101,348

PROCESS FOR PREPARING HOT-PRESSED SINTERED ALLOYS

Jean Berchtold, La Jolla, Calif., assignor to Spin Physics, San Diego, Calif.

Division of Ser. No. 59,512, Jul. 30, 1970, Pat. No. 3,999,216. This application Dec. 29, 1975, Ser. No. 645,177

Int. Cl.[2] H01F *1/02*

U.S. Cl. 148—105 **11 Claims**

1. A process for preparing an aluminum-silicon-iron alloy compact exhibiting an improved combination of electrical and physical properties which process comprises:

(1) providing an aluminum-silicon-iron alloy powder having a grain size in the range of about 10 to 500 microns and an aluminum content of about 4 to about 9%, by weight, a silicon content of about 8 to about 11%, by weight, and the remainder essentially iron,

(2) nitriding said powder,

(3) sintering said nitrided powder at a temperature of at least 1200° C, and

(4) hot-pressing said powder simultaneously with or after said sintering by exerting mechanical pressure of at least 1000 psi. on said powder, said sintering and hot-pressing being continued until said powder is formed into a compact having a porosity of less than 0.1%, a Vickers hardness greater than 600 (measured at a 300 gram load) and a resistivity of at least 100 micro-Ohm-cms.

4,101,349

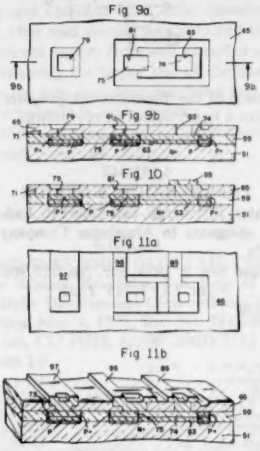
INTEGRATED INJECTION LOGIC STRUCTURE FABRICATED BY OUTDIFFUSION AND EPITAXIAL DEPOSITION

Bruce B. Roesner, Tustin, and Denis J. McGreivy, Laguna Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 29, 1976, Ser. No. 736,976

Int. Cl.[2] H01L *21/22, 27/04*

U.S. Cl. 148—175 **3 Claims**



1. A method of fabricating an integrated circuit comprising the steps of

(a) driving, into first and second spaced-apart regions in the surface of a first conductivity type semiconductor body, a second conductivity type dopant;

(b) growing a first conductivity type epitaxial layer on said surface and auto-doping dopant from said spaced-apart regions in said semiconductor body to form corresponding first and second spaced-apart buried, second conductivity type regions in said epitaxial layer;

(c) driving a second conductivity type dopant into the surface of said epitaxial layer to form first and second conductive regions extending from said last recited surface to said first and second buried regions, said second conductive region having an annular configuration and, together with said second buried region, forming a bucket-shaped region in said epitaxial layer; and

(d) depositing electrical contacts on said epitaxial layer over said first and second conductive regions and over that portion of said epitaxial layer which is within said annular region.

4,101,350

SELF-ALIGNED EPITAXIAL METHOD FOR THE FABRICATION OF SEMICONDUCTOR DEVICES

Glen G. Possley, Sugarland; Robert G. Massey, Sherman, and Billy B. Williams, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 556,037, Mar. 6, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,725

Int. Cl.[2] H01L *21/20, 21/76*

U.S. Cl. 148—175 **5 Claims**

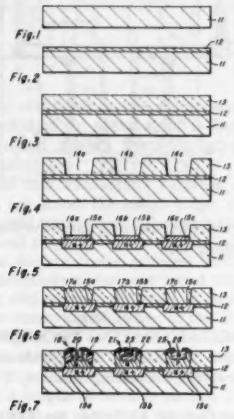
1. A method for the fabrication of a semiconductor device comprising the steps of:

preparing a moncrystalline silicon substrate of one conductivity type having a crystallographic surface orientation of (100), a resistivity of 10 to 15 ohm-centimeters, and a thin surface layer thereon of the same conductivity type, said surface layer extending across the entire substrate surface

and having a resistivity of about 0.1 ohm-centimeter or less;

forming an apertured diffusion or implantation mask on said substrate;

selectively placing impurities of the opposite conductivity type in said substrate through at least one aperture in said mask to a depth greater than the thickness of said surface layer, and with a dosage sufficient to convert the affected portion of said surface layer to said opposite conductivity type; and



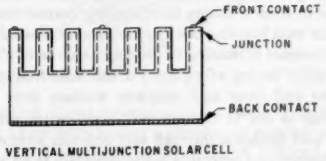
thereafter, using the same mask and the same aperture, selectively growing epitaxial monocrystalline silicon in said aperture, to a thickness substantially the same as the thickness of said mask, whereby the resulting epitaxial region is inherently aligned with the region in said substrate formed by said step of selectively placing impurities in said substrate through said aperture, and whereby the mask and the epitaxial layer exhibit a substantially coplanar surface for subsequent processing.

4,101,351

PROCESS FOR FABRICATING INEXPENSIVE HIGH PERFORMANCE SOLAR CELLS USING DOPED OXIDE JUNCTION AND INSITU ANTI-REFLECTION COATINGS

Pradeep L. Shah, Dallas, and Clyde R. Fuller, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 15, 1976, Ser. No. 742,027
Int. Cl.² H01L *21/225*
U.S. Cl. 148—188 **1 Claim**



VERTICAL MULTIJUNCTION SOLAR CELL

1. A process for the fabrication of a solar cell comprising the steps of:

(a) applying a silicon oxide-forming, arsenic-comprising, dopant source composition to a monocrystalline silicon body of p-type conductivity, said dopant source comprising a solution of an arsenic-doped reaction product obtained by refluxing tetraethylorthosilicate with acetic anhydride or acetic acid;

(b) heating the resulting composite to a diffusion temperature for a time sufficient to diffuse said arsenic dopant into the silicon body, thereby forming a p-n junction,

(c) selectively patterning the remaining doped silicon oxide source layer to provide apertures therein for metallization of the diffused region;

(d) depositing and patterning a metal film on said patterned dopant source layer, whereby said dopant source layer is retained as an anti-reflection coating.

4,101,352

DEFLAGRATIVE ELECTRONIC COMPONENT POTTING COMPOUND

Clyde J. Poulin, Phoenix, Ariz., and Theodore N. Bryla, Glendora, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 8, 1971, Ser. No. 113,705
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.2 **3 Claims**

1. A deflagrative potting material for electronic assemblies which upon ignition serves as a discrete heat source for the destruction of said assemblies consisting of a mixture of:

6% by weight of 1 to 3 micron particle size boron

15% by weight of 18 micron particle size magnesium

39% by weight of 8 micron particle size potassium perchlorate, and

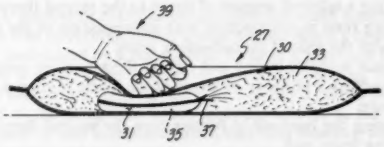
40% by weight of low viscosity, low temperature curing silicone resin.

4,101,353

METHOD FOR SPLICING CABLES AND HOT PACK FOR USE THEREIN

Susan Steves Watson, Mountain View, Calif., assignor to Kay Laboratories, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 479,844, Jun. 17, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 767,898
Int. Cl.² H01R *5/02*
U.S. Cl. 156—49 **21 Claims**



1. A method of splicing a first cable end to a second cable end, including the steps of:

connecting the first cable end to the second cable end to form a conductor junction:

providing a sleeve formed from a material having dielectric properties and having a circumferential dimension greater than the individual circumferential dimensions of the first cable end and the second cable end, the material of the sleeve having properties responsive to temperatures in excess of a first particular temperature for shrinking the sleeve to provide the sleeve with a circumferential dimension less than the individual circumferential dimensions of the first cable end and the second cable end;

providing, in isolated relationship in a pack, first and second chemicals having properties of reacting chemically and exothermically at ambient temperatures to produce, in the peripheral and interior regions of the pack, first by-products and first increases of temperature involving the production of a second particular temperature above ambient temperature but less than the first particular temperature and the first by-products having properties of reacting chemically and exothermically at the second

particular temperature with the first particular chemicals and with each other to produce, in the interior regions of the pack, second by-products and second increases of temperature involving the production of a third particular temperature greater than the first particular temperature, thereby producing, at the peripheral regions of the pack, temperatures above the first particular temperature for the extended period of time, the first chemical constituting a metal salt selected from a group consisting of calcium chloride, calcium oxide and magnesium chloride and the second chemical constituting a polyalcohol selected from a group consisting of ethylene glycol, 1, 4-butanediol and glycerol;

providing for a controlled accession of the first and second chemicals in the pack from their isolated relationship to obtain a controlled mixing of the first and second chemicals; and

disposing the pack around the sleeve in abutting and conformed relationship to the sleeve and with the first and second chemicals in isolated relationship to each other to provide for a controlled accession of the first and second chemicals and a shrinking of the sleeve around the conductor junction upon the controlled accession of the first and second chemicals.

4,101,354

COATING FOR FIBROUS CARBON MATERIAL IN BORON CONTAINING COMPOSITES

Robert C. Shaffer, Playa del Rey, Calif., assignor to Hitco, Irvine, Calif.

Filed Jul. 1, 1976, Ser. No. 701,597
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—60 **13 Claims**

1. A method of making a carbon-carbon composite comprising the steps of:

providing a fabric of carbon material which is free of boron;

applying a coating of a flexible thermosetting resin which is free of boron and which remains flexible upon curing to the fabric;

curing the flexible thermosetting resin;

impregnating the fabric with a second thermosetting resin;

adding a selected amount of boron to the second thermosetting resin in conjunction with impregnation of the fabric with the second thermosetting resin;

at least partially curing and second thermosetting resin;

assembling a plurality of layers of the fabric to form a laminate;

treating the laminate to further cure the second thermosetting resin; and

heating the laminate to at least about 4000° F. in an inert atmosphere while simultaneously applying pressure to the laminate to carbonize and at least partially graphitize the flexible thermosetting resin and the second thermosetting resin.

4,101,355

METHOD OF AND MEANS FOR MAKING VARIABLE WIDTH ZIPPER PROFILE FILM

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021

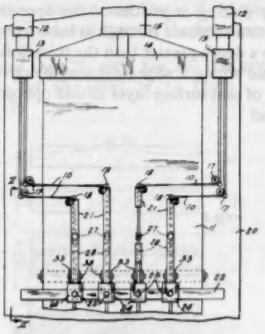
Filed Jan. 21, 1977, Ser. No. 761,670
Int. Cl.[2] B29C *27/00*
U.S. Cl. 156—66 **28 Claims**

1. A method of making variable width profile film web whereby a substantially continuous prefabricated resiliently flexible extruded profiled plastic fastener strip is joined to a prefabricated substantially continuous film web, compromising the steps of:

effecting continuous running travel of the web and the fastener strip in the same longitudinal direction and at the same speed;

adjusting the position of the fastener strip transversely relative to the web while the web and the fastener strip are travelling without interruption;

guiding the fastener strip into convergence with the web;



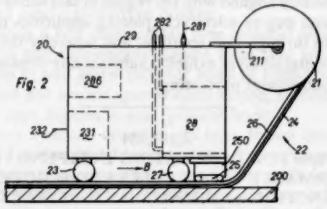
and then permanently securing the travelling fastener strip to the travelling web.

4,101,356

METAL COATING PROCESS

Leonardus Joseph Savelkouls, Bergschenhoek, Netherlands, assignor to Progress Processing Limited, Vaduz, Liechtenstein

Filed Oct. 25, 1977, Ser. No. 844,525
Claims priority, application Netherlands, Nov. 5, 1976, 7612325
Int. Cl.[2] E04B *2/00;* **B29C** *19/02*
U.S. Cl. 156—71 **13 Claims**

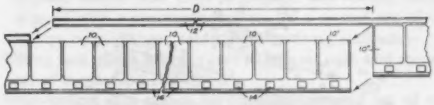


1. In the process of coating a metal substrate with a substantially uniform layer of an organic polymer composition by providing a polymer stratum including a heat or melt bonding polymer composition in a contacting relation with said metal substrate, subjecting said metal substrate to electromagnetic radiation capable of heating said substrate for activation of said melt bonding composition, and allowing said metal substrate to cool so as to form a strong interbonding connection between said heat or melt bonding composition and said metal substrate; the improvement consisting of moving a source of electromagnetic radiation having a frequency in the radio frequency range relative to and over said polymer stratum near a surface thereof that is not in contact with said metal substrate for directing said radiation through said polymer stratum without heating thereof and onto said metal substrate in an area where said metal substrate is in said contacting relation with said polymer stratum and for briefly heating a surface portion of said metal substrate in said area by said radiation to a temperature at which said heat or melt bonding composition is capable of forming said interbonding connection, and continuously displacing said area by said movement of said source of said electromagnetic radiation relative to said substrate.

4,101,357
METHOD OF SPLICING MOTION PICTURE SOUND FILM

Arthur A. Rothrock, 8112 N. Druid St., Portland, Oreg. 97203

Division of Ser. No. 749,746, Dec. 13, 1976, Pat. No. 4,052,247.
This application May 6, 1977, Ser. No. 794,656
Int. Cl.[2] B31F *5/06*
U.S. Cl. 156—159 5 Claims



1. The method of splicing motion picture sound film wherein the sound recorded on the sound stripe is displaced longitudinally of the related picture frame by several frames, the method comprising:

(a) cutting the film transversely between adjacent picture frames but not across the sound stripe, thence longitudinally from said transverse cut between the picture frames and the sound stripe to a point at which the sound relates to the first picture frame adjacent said transverse cut, thence transversely across said sound stripe,

(b) repeating said cutting operation at another location on the film for removing a portion of the film, whereby one of the mating ends of the film to be joined has a length of sound stripe extending longitudinally from an end picture frame and the other of the mating ends of the film to be joined has a length of several picture frames extending longitudinally from the sound stripe the same distance as the longitudinally extending sound stripe on the said one end of film,

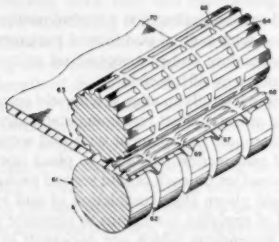
(c) placing the edges of said mating ends of film in mutual abutment, and

(d) securing said abutment mating ends together.

4,101,358
METHOD OF MAKING NETWORK STRUCTURES

Charles W. Kim, Wilmington; Chia-Seng Liu, and Richard MacDuff, both of Newark, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 590,664, Jun. 26, 1975, abandoned, which is a division of Ser. No. 324,028, Jan. 16, 1973, Pat. No. 3,922,329.
This application Dec. 15, 1976, Ser. No. 750,982
Int. Cl.[2] D02J *1/22*
U.S. Cl. 156—167 6 Claims



1. A method of making a nonwoven fabric comprising:

forming a first sheet having a plurality of parallel continuous main ribs interconnected by webs of reduced thickness extending in a first direction on one side thereof and a plurality of parallel discontinuous tie ribs on the other side thereof extending in a second direction other than said first direction, said tie ribs being formed opposite the webs interconnecting said main ribs and having no substantial portion thereof crossing over a main rib;

drawing said sheet in at least one direction to separate the main ribs into oriented continuous main filaments having a substantially uniform cross-section and to separate the tie ribs into tie filaments uniformly interconnecting the main filaments, thereby forming a first uniform network structure;

forming a second sheet having a plurality of parallel continuous main ribs interconnected by webs of reduced thickness extending in a third direction other than said first direction on one side thereof and a plurality of parallel discontinuous tie ribs on the other side of said sheet extending in a direction other than said third direction, said tie ribs being formed opposite the webs interconnecting said main ribs and having no substantial portion thereof crossing over a main rib;

drawing said second sheet in at least one direction to separate the main ribs into oriented continuous main filaments having a substantially uniform cross-section and to separate the tie ribs into tie filaments uniformly interconnecting the main filaments thereby forming a second uniform network structure; and

bonding said first network structure to said second network structure to provide a fabric having substantially uniform and continuously oriented main filaments formed in both said first and said third directions.

4,101,359
COMPOSITE MATERIAL FOR USE IN COVERING WALLS, AND A METHOD OF MANUFACTURING SAME

Olivier Faillliot, Rochefort en Yvelines, France, assignor to Compagnie des Etablissements de la Risle-Papeteries de Pont-Audemer, Paris, France

Filed Sep. 14, 1976, Ser. No. 723,181
Claims priority, application France, Sep. 24, 1975, 75 29222; Jul. 7, 1976, 76 20714
Int. Cl.[2] B32B *29/02*
U.S. Cl. 156—179 6 Claims

1. A method of manufacturing composite sheet material for use as wall coverings, which comprises providing a composite layer constituted by a net material forming a grid each face of which is covered by a layer of cellulosic wadding bonded along the threads forming said grid, bonding a carrier sheet of paper to the composite layer, applying colours in the entire thickness of said composite layer, and then bonding together the layers of cellulosic wadding over their entire surface facing one another through the mesh openings in the grid.

4,101,360
METHOD AND APPARATUS FOR FOLDING AND FUSING THE ELEMENTS OF A SLIDE FASTENER STRING

Lawrence S. Monroe, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 699,210, Jun. 23, 1976, Pat. No. 4,025,277.
This application Mar. 22, 1977, Ser. No. 780,214
Int. Cl.[2] B29C *19/04*
U.S. Cl. 156—200 2 Claims

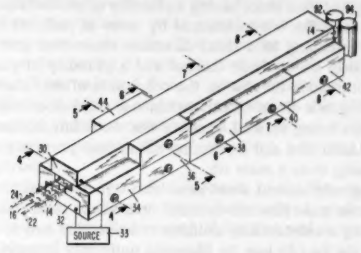
1. A method of folding the thermoplastic coupling elements of a slide fastener string comprising the steps of

generating a high frequency electromagnetic field between a pair of spaced electrodes,

pulling the slide fastener string through the field between the electrodes to heat and soften the coupling elements,

initially concentrating the electromagnetic field at the point on each of the coupling elements at which the folding is to take place

guiding the coupling elements to a folded position by drawing the coupling elements through a plurality of guide sections, each of the guide sections progressively folding each of the coupling elements, and



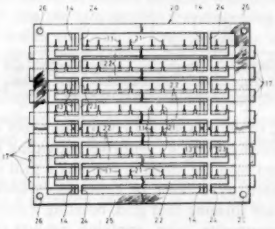
drawing the string through a set stage in which the folded coupling elements are cured in their folded position.

4,101,361

METHOD OF MANUFACTURING LAMINATED BUSES

Shunichi Fukuda, Inashiki; Masaaki Muto, and Syoichi Iwabuchi, both of Tuchiura, all of Japan, assignors to Nippon Mektron Kabushiki Kaisha, Japan

Filed Mar. 10, 1977, Ser. No. 776,303
Claims priority, application Japan, Oct. 9, 1976, 51-121463
Int. Cl.[2] B32B *31/00;* B23P *17/00;* H01B *13/00*
U.S. Cl. 156—250 **19 Claims**



1. A method of manufacturing laminated buses comprising:

(a) stacking and temporarily bonding a plurality of electrically conductive perforated sheets and a plurality of insulating tapes in alternating relation to form a temporarily bonded laminate,

the perforated sheets comprising a plurality of parallel elongated conductor elements each having sides and ends, formed with terminals, spaced from each other, and spaced from an outer frame surrounding the conductor elements, said perforated sheets having means for connecting the sides of the conductor elements with said frame,

the insulating tapes being aligned with each of the conductor elements, extending from said ends of said conductor elements to said outer frame and being bonded temporarily to said outer frame;

(b) removing said means for connecting the sides of the conductor elements with said frames and allowing said conductor elements to be supported to said frame by said insulating tapes; and

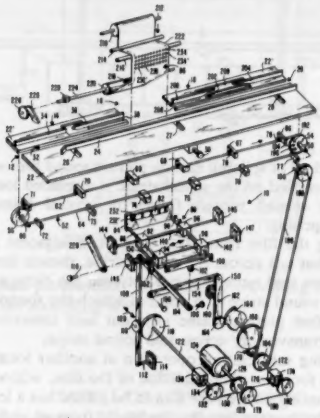
(c) laminating said temporarily bonded laminate to form a bonded laminate including the laminated buses.

4,101,362

METHOD FOR APPLYING TRANSFERS

Max Norris Baker, Rural Hall, and Julian Richard Martin, Winston Salem, both of N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.

Filed Apr. 19, 1976, Ser. No. 678,263
Int. Cl.[2] B44C *1/16;* B32B *1/10*
U.S. Cl. 156—235 **13 Claims**



1. A method for applying transfers to a plurality of packages, comprising:

advancing a first plurality of packages into a transfer station having a movable platen, means for supporting the packages, and a transfer sheet carrying rows and columns of tranfers, said transfer sheet being interposed between said platen and said packages with at least one row of transfers aligned with said packages;

positioning said first packages at a first position in said transfer station with each of said first packages aligned with a corresponding one of a first set of transfers in said at least one row of transfers;

aligning said platen with said first set of transfers;

moving said platen into engagement with said first set of transfers and said first packages to place one transfer from said first set on each of said first packages;

withdrawing said platen after completion of said transfer;

removing said first packages from said transfer station and advancing a second plurality of packages into said transfer station;

positioning said second packages at a second position in said transfer station with each of said second packages aligned with a corresponding one of a second set of transfers in said at least one row of transfers;

shifting said platen laterally to align it with said second set of transfers, said transfer sheet remaining stationary;

moving said platen into engagement with said second set of transfers and said second packages to place one transfer from said second set on each of said second packages; and

withdrawing said platen after completion of said transfer.

6. In a method of applying tax stamps to cigarette packages of non-standard dimensions which are packaged in cartons, said tax stamps being mounted on conventional transfer sheets in rows and columns which are, spaced for application to packages of standard dimensions, loading cartons of cigarette packages to be stamped for advancement by a conveyor, advancing each carton in turn through an opening station, a transfer station and a closing station, stopping each opened carton in said transfer station, and applying tax stamps to each package in said carton, the improvement comprising: ;p1 positioning a first carton at a first location in said transfer station with each package in said carton disposed on its side and the

ends of each of said packages aligned with a corresponding one of a first set of tax stamps on said sheet;

aligning a platen with said first set of tax stamps;

reciprocating said platen to drive said set of tax stamps against the ends of corresponding packages to transfer said stamps from said sheet to said packages;

advancing said first carton out of said transfer station and advancing a second carton into said transfer station;

positioning said second carton at a second location in said transfer station with each package in said second carton aligned with a corresponding one of a second set of tax stamps on said sheet, said sheet remaining stationary;

shifting said platen laterally into alignment with said second set of tax stamps; and

reciprocating said platen to drive said second set of tax stamps against corresponding packages to transfer said stamps from said sheet to said packages.

4,101,363

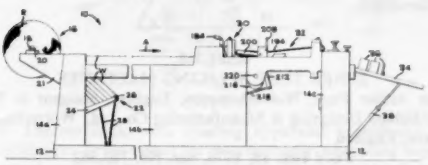
METHOD OF MAKING BOTTOM SEAL THERMOPLASTIC BAGS

Ronald L. Lotto, Bonduel, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 198,282, Nov. 12, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 344,700

Int. Cl.² B32B *31/00*

U.S. Cl. 156—250 **5 Claims**



1. In a method making bottom weld bags from a supply of elongate thin, flexible multi-layer web of thermoplastic material, which comprises the steps of converting normally continuously rotary motion to oscillatory motion for providing an oscillating drive having a web feed stroke in one direction and a reverse stroke in the opposite direction with said stroke progressively increasing and then decreasing in velocity from zero velocity to a maximum velocity and back to zero velocity between reversals of stroke direction, gripping the web between rotatable draw rolls and maintaining the grip of said rolls on the web during both of said strokes, separating transversely disposed seal bars and clutching a draw roll to the oscillating drive during the latter's feed stroke for drawing a trailing length of the web from the supply while advancing a leading edge of the web for motion between and past the seal bars, declutching said draw roll from the drive and preventing web motion at the end of the feed stroke, severing the web downstream of the seal bars and bringing the seal bars together for making a weld at the leading edge of the severed web, separating the seal bars and feeding a new length of web between the separated seal bars; the improvement comprising the steps of freeing said web for motion and clutching the draw roll to the oscillating drive during the final portion of the drive reverse stroke for rotating the draw rolls in a reverse direction sufficiently to strip the weld from the seal bars and maintaining the clutching of the draw roll to the drive after termination of said final portion of the drive reverse stroke and throughout the succeeding drive feed stroke for restoring the weld to its previous position between the seal bars and feeding a new length of the web past the seal bars while the seal bars remain separated.

4,101,364

METHOD OF AN APPARATUS FOR PRODUCING FILM-LAMINATED BASE PLATES

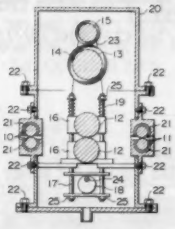
Katsushige Tsukada; Nobuyuki Hayashi; Hideo Yamada; Toshiaki Ishimaru; Asao Isobe, and Tadazi Sato, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,400

Claims priority, application Japan, Jul. 30, 1975, 50-92963

Int. Cl.² B29C *17/00*

U.S. Cl. 156—286 **14 Claims**



1. A method of laminating a film onto a base plate comprising:

evacuating a lamination chamber to at least 200 mm Hg;

feeding a base plate into said lamination chamber through air tight feed-in rolls;

supplying a film, from a film supply within the lamination chamber, onto the base plate within said lamination chamber;

pressing said film onto said base plate within said lamination chamber for laminating the film onto the base plate; and

feeding the laminated plate from within the lamination chamber through air tight feed-out rolls.

4,101,365

PROCESS OF MAKING HIGH SPEED MULTIFACETED POLYGONAL SCANNERS

Tibor Fisli, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1976, Ser. No. 687,963

Int. Cl.² B29C *27/16*; G02B *5/08*

U.S. Cl. 156—294 **8 Claims**

1. A process of making a high speed multifaceted polygonal scanner comprising providing a die cavity having a geometry which includes a plurality of facet shaped surfaces, placing an aluminum member into said cavity, said aluminum member being sized so as to provide a gap for a suitably dimensioned injected material having suitable mechanical and optical properties for high speed scanning applications, and injection molding acrylic into the gap between the aluminum member and the die cavity, an injected molded acrylic scanner comprising the injected molded acrylic having a plurality of facets on one surface thereof and an aluminum member thereby being formed, removing said injected molded acrylic scanner from said die cavity, coating the facets of said acrylic scanner with magnesium fluoride, and then applying a mirrorlike finish of aluminum to the surface of said magnesium fluoride coated acrylic scanner to provide a high speed multifaceted polygonal scanner, said magnesium fluoride enhancing the adherence of said aluminum finish to said acrylic scanner.

5. A process of making a high speed, multifaceted polygonal scanner comprising providing an aluminum member which is capable of accepting an acrylic material on its periphery, providing an injection molded acrylic material having a first surface which comprises a plurality of facets and a second surface sized so as to conform to the periphery of said aluminum member, cementing said acrylic material to the periphery of said aluminum member, coating the facets of said acrylic material with magnesium fluoride and then applying a mirrorlike finish

of aluminum to the surface of said magnesium fluoride coated facets to provide the high speed multifaceted polygonal scanner, said magnesium fluoride enhancing the adherence of said aluminum finish to said acrylic material.

4,101,366

ELECTRONIC DIGITAL DISPLAY SCALE WITH LABEL PRINTER

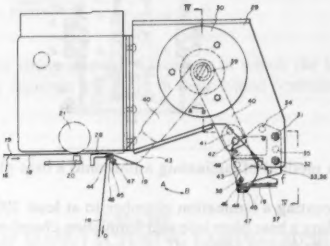
Kazuharu Teraoka, and Kazuo Nishimura, both of Tokyo, Japan, assignors to Teraoka Seikosho Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,931

Claims priority, application Japan, Sep. 4, 1975, 50-107207; Dec. 23, 1975, 50-153782

Int. Cl.² G01G *19/413*

U.S. Cl. 156—378 **3 Claims**



1. An electronic digital display scale with a label printer having a printing mechanism adapted to print a weight and other information of an article which is weighed and adhere said label to said weighed article, wherein a printed label is held and transferred to a label applying position above a scale plate located outside a frame by adhering a label transfer device to an adhesive surface of the label and is applied onto said weighed article by depressing the weighed article against the label adhered to said label transfer device comprising:

a driving mechanism fixed at the center of a side plate which is fixed to a label printer frame;

a first setting plate fixed to the lower part of said side plate through two connecting rods;

a second setting plate opposed to said first setting plate through two connecting rods;

a receiving plate rotatably fixed to the lower end part of both said setting plates through a shaft;

a switching mechanism fixed to one of said setting plates with a small distance from said receiving plate above thereof, and connected with said printing mechanism;

a first swing plate secured at a shaft of said driving mechanism;

a second swing plate secured through two connecting rods to said first swing plate; and

two label transfer bars including coil springs rotatably mounted to the peripheries of said transfer bars secured at the lower end part of said other swing plate.

4,101,367

SINGLE FACE CORRUGATING MACHINE

Johann Maier, Weiden, Opf., Fed. Rep. of Germany, assignor to BHS-Bayerische Berg-,Hutten-und Salzerke Aktiengesellschaft, Fed. Rep. of Germany

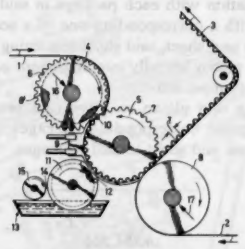
Filed Mar. 16, 1977, Ser. No. 778,106

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611325

Int. Cl.² B31F *1/28*

U.S. Cl. 156—471 **17 Claims**

1. A machine for corrugating a single face of a paper web, said machine comprising, a first serrated roller and a second serrated roller positioned for cooperative engagement therebetween, a pressure roller positioned for cooperation with said second serrated roller, each said serrated roller having serration-type teeth with tooth tips and tooth roots, a paper web to be corrugated adapted to be fed between said serrated rollers under mutual pressure exerted upon said web, a cover paper web adapted to be supplied and glued to the corrugated paper web between said second serrated roller and said pressure roller, the tooth root contour of said second serrated roller being of generally concave curve configuration and formed by rolling the tooth tip of the first serrated roller against the



second serrated roller with said paper web between said rollers, said serrated rollers being rotatable in opposite directions and having constant axial spacing, said pressure roller having longitudinal serrations formed parallel to the axis of said pressure roller, the contours of said longitudinal serrations being rolling curves and formed by rolling the tooth tip of said second serrated roller against the pressure roller with said corrugated paper web and cover web between said last named rollers.

4,101,368

INNER TUBE SPLICING MACHINES

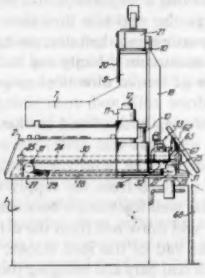
Roy Arthur Page, Wolverhampton, England, assignor to The Midland Designing & Manufacturing Co. Ltd., Wolverhampton, England

Filed Dec. 15, 1976, Ser. No. 750,582

Claims priority, application United Kingdom, Jan. 8, 1976, 630/76

Int. Cl.² B29H *15/04*; G03D *15/04*

U.S. Cl. 156—503 **10 Claims**



1. An inner tube splicing machine having a pair of spaced apart tube end supporting tables, each of said tables having in operative association therewith a tube end clamping arm, one of said tables and its coacting arm being movable towards the other of said tables and its coacting arm to effect splicing of the tube ends, support means positioned above said supporting tables to support the bulk of said tube to be spliced, a cutting assembly arranged to be reciprocated relative to said supporting tables and their said coacting clamping arms to cut said tube ends prior to said splicing operation, said tube end cutting assembly being mounted on a pair of horizontally disposed spaced parallel guide shafts, and hydraulically powered pis-

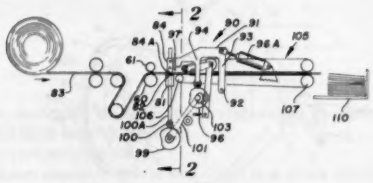
ton/cylinder means operatively connected to said cutting assembly to cause reciprocal movement of said cutting assembly on said guide shafts relative to said tube end supporting tables and said coacting clamping arms of the machine to effect a cutting operation, said tube end cutting assembly comprising a supporting carriage having a knife table slidably mounted on said guide shafts, a bearing block supported on said knife table, first and second vertically disposed spindles turnably mounted in said bearing block, a cutting device secured to one end of each of said first and second spindles, each of said cutting device having a pair of spaced knife holders and a cutting blade extending therebetween, an actuator block fixed to the other end of each of said first and second spindles, and an electrically operated solenoid the actuator arm of which solenoid is arranged to impart angular turning movement to said actuator blocks which in turn impart angular turning movement to said cutting devices to move said cutting devices between cutting and non-cutting positions.

4,101,369

BOTTOM SEAL CUT-OFF

Richard C. Adams, West Barrington, R.I., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Mar. 31, 1972, Ser. No. 240,075
Int. Cl.[2] B32B *31/00*; B30B *15/34*
U.S. Cl. 156—510 **2 Claims**



1. Thermoplastic web treating apparatus comprising, in combination, drive means for intermittently advancing superimposed webs of thermoplastic sheet film material along a certain predetermined plane of travel and for stopping said superimposed webs for a predetermined period of dwell, hot knife means for thermally welding said superimposed webs together at predetermined spaced intervals therealong, and blade means for severing said superimposed webs at predetermined spaced intervals therealong; said apparatus comprising:

(a) drive means including draw roll means in driving contact with said webs for imparting repeating cycles of intermittent motion and dwell to said web with the motion being reversible between motion in the forward web direction and motion in the reverse web direction;

(b) said severing blade means including a knife having a cutting blade secured thereto and knife actuating means for reciprocatorily moving said cutting blade through the plane of travel of said web to sever said web;

(c) hot knife means including a heated welding bar and a back-up pad therefor, actuating means for reciprocatorily moving said heated welding bar to bring said welding bar into contact with said superimposed webs against said back-up pad for a predetermined period of time for welding portions of said superimposed webs together;

(d) control means for determining the draw and dwell cycles of said drive means and for controlling the period of operation of said severing blade means and said welding bar;

(e) said severing blade means and welding bar means being arranged to cut and weld said film during web dwell with the cutting operation of said blade preceding the welding operation for severing said film prior to welding, said control means being arranged to actuate said draw rolls in a draw cycle which includes two directions of motion of web draw with an initial period of motion in the draw rolls being in the reverse web direction to release said web from the surface of said back-up pad, and a second period of motion in the forward web direction to advance said superimposed webs preparatory to the next succeeding period of dwell; and

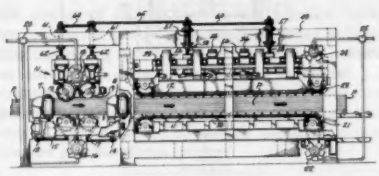
(f) means are provided for biasing said cutting blade toward said film in a first operational mode and for retracting said cutting blade away from said film in a second operational mode.

4,101,370

LAMINATING TRAVELLING PRESS

George F. Russell, 8513 - 42nd Ave. W., Tacoma, Wash. 98466

Division of Ser. No. 357,960, May 7, 1973, Pat. No. 3,943,025.
This application Feb. 5, 1976, Ser. No. 655,619
Int. Cl.[2] B30B *5/06*
U.S. Cl. 156—555 **18 Claims**



15. A laminating travelling press for laminating a pack of boards comprising elongated first moving means engageable with one side of the pack of boards, elongated second moving means engageable with the other side of the pack of boards, said first moving means and said second moving means cooperating for moving the pack of boards lengthwise, first motor means for driving said first moving means, second motor means for driving said second moving means, means for synchronizing operation of said first motor means and said second motor means for synchronizing movement of said first moving means and said second moving means, hold-down means spaced lengthwise of the pack of boards from said first moving means, first adjusting means for adjusting the position of said first moving means transversely of its length, hold-down-adjusting means for adjusting the position of said hold-down means transversely of the length of said first moving means, and coordinating means connecting said first adjusting means and said hold-down-adjusting means for effecting simultaneous and equal adjustment of said first moving means and of said hold-down means.

4,101,371

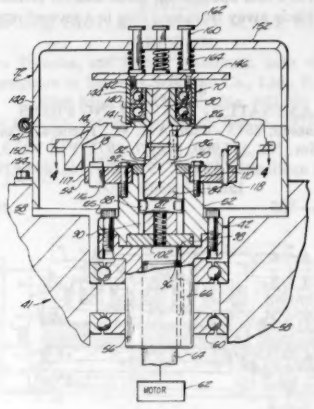
APPARATUS FOR FASTENING CERAMIC MAGNETS TO A FLYWHEEL USING CENTRIFUGAL FORCE

Glenroy Newcomb Aggen, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 573,929, May 2, 1975, Pat. No. 4,011,120.
This application Dec. 2, 1976, Ser. No. 746,953
Int. Cl.[2] H02K *15/02*
U.S. Cl. 156—560 **8 Claims**

1. An apparatus for use in attaching a magnet to a radially inner surface of a rotor for use in a dynamo-electric system and the like with said magnet being located at a predetermined position circumferentially of said rotor comprising a vertically disposed rotatable spindle adapted to be driven by a motor or the like, a disc fastened to said spindle and extending radially outwardly of said spindle in a horizontal direction, means for fastening said rotor on said spindle for corotation therewith with said inner surface of said rotor being concentric with the rotational axis of said spindle and located at a predetermined radial distance from and at a predetermined position axially of said spindle such that at least a portion of said inner rotor surface is disposed above a top surface of said disc, magnet positioning means on said disc at an upper surface thereof so as to be located radially inwardly of said rotor surface when said rotor is assembled on said spindle, said magnet positioning

means being arranged to locate said magnet radially inwardly of said rotor surface in general alignment with said predetermined circumferential position on said rotor, said magnet positioning means being further arranged and disposed so as to guide said magnet radially outwardly into engagement with



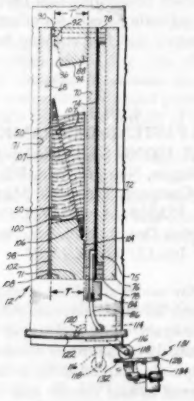
said rotor at said predetermined circumferential position when said magnet is located in said positioning means, said rotor is assembled on said spindle and said spindle is rotated to cause said magnet to move radially outwardly due to centrifugal forces.

4,101,372

WIDTH ADJUSTING THICKNESS SETTING CLAMPING SYSTEM

Earl Dean Hansenwinkle; Clement Kuanoni, and Frank Wislocker, all of Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 13, 1977, Ser. No. 759,167
Int. Cl.[2] B23K *27/00*
U.S. Cl. 156—580 **9 Claims**



1. A width adjusting thickness setting clamping apparatus for clamping together at least one pair of elongated substantially triangular-shaped solid pieces with the thin edge of one approximately adjacent the thick edge of the other, an individual clamping mechanism comprising:

a first edge platen having a predetermined thickness dimension positioned between a pair of face platens,

said pair of face platens being substantially parallel to each other with at least one of said face platens being movable relative to the other between a clamped position and a retracted position,

a second edge platen slidable between said pair of face platens and having a predetermined thickness dimension substantially similar to said first edge platen,

means for moving said second edge platen toward said first edge platen when said face platens are substantially in their retracted positions allowing a pair of said pieces positioned within a clamping mechanism to slide relative to one another, thereby adjusting the width of said pair, and

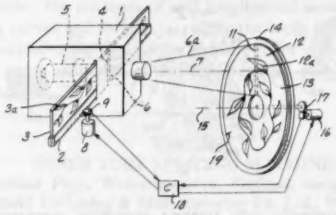
means for moving at least one of said face platens toward the other and into said clamped position abutting said first and second edge platens and said pair of said pieces, thereby setting the thickness dimension of said pair.

4,101,373

METHOD AND APPARATUS FOR PRODUCING A DESIGN ON A FLAT SURFACE ADAPTED TO BE FORMED INTO AN ARCUATE SURFACE

Murray M. Schiffman, Westport, Conn., assignor to MBI, Inc., Westport, Conn.

Filed Oct. 18, 1976, Ser. No. 733,711
Int. Cl.[2] G03B *27/32, 21/00*
U.S. Cl. 156—659 **14 Claims**



1. A method of transferring a design from a flat rectangular-coordinate form to a flat polar-coordinate form, comprising progressively projecting successive narrow transverse images of the design from a flat rectangular transparency and progressively rotating a flat surface spaced from the transparency about an axis such that the narrow transverse images of the design are successively projected upon and received in polar-coordinate form by narrow radial segments of the flat surface maintained substantially perpendicular to the direction of projection.

7. A method of producing a polar-coordinate design on a flat image surface from a rectangular-coordinate design, comprising:

(a) forming the design in rectangular-coordinate form upon a relatively flat transparency;

(b) progressively and sequentially exposing narrow transverse areas of the transparency to a directional light source whereby images of the design are progressively and sequentially projected in the direction of the light;

(c) providing the flat image surface with a photosensitive coating;

(d) disposing the flat image surface spaced from the transparency such that narrow radial segments thereof are progressively and sequentially maintained substantially perpendicular to the direction of the light and substantially parallel with the projected images;

(e) rotating the flat image surface about an axis in synchronization with the progressive projection of the transparency such that the projected narrow transverse images of the design are progressively and sequentially received by said narrow radial segments of the flat image surface and the design in polar-coordinate form is exposed upon the photosensitive coating of the image surface; and

(f) processing the exposed coating on the flat image surface to selectively produce the design upon the surface.

4,101,374
DEWATERING DEVICE INCLUDING A DRUM WITH RADIALLY SLANTED CELLS

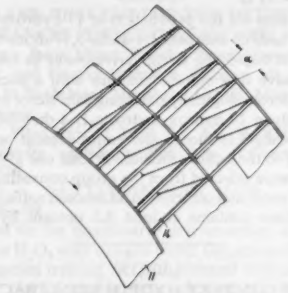
Dietrich Nebel, Engelsweidchen 11, Stockheim-Kreuzau, and Hans Reicherter, Oberhaldenweg 35, 7417 Pfullingen, both of Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 729,970

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544750

Int. Cl.² D21F *1/04*

U.S. Cl. 162—306 **19 Claims**



1. A device to de-water fiber suspensions to form a de-watered fiber sheet comprising:

(a) a perforated drum

(b) drive means to rotate said drum in a given direction of rotation about a horizontal axis of rotation;

(c) said drum having a drum wall for supporting a mesh sieve and containing a plurality of radially disposed open ended cells, said cells being formed in part by bridges which extend axially relative to said drum wall and are radially slanted forward relative to the direction of rotation of said drum at least at their outer ends to define an acute angle of at least 10 degrees with a radial plane passed through the respective bridge;

(d) a material feeder to feed fiber suspension onto said drum, said material feeder terminating at a point which lies adjacent said drum wall and approximately at the beginning of a first quadrant of said drum to feed said fiber suspension thereat, and the cross-section of said drum being considered to have a first quadrant defined by the portion of said drum rising in the direction of rotation from the horizontal plane in which the axis of rotation of said drum lies, and second, third and fourth quadrants consecutively numbered in the direction of rotation; and

(e) take off means disposed adjacent said drum wall at the beginning of said second quadrant to remove de-watered fibersheet tangentially from said drum wall.

4,101,375
ISOTOPICALLY ENRICHED HELIUM-4

Leo Garwin, 326 Oklahoma Mortgage Bldg., Oklahoma City, Okla. 73102

Continuation-in-part of Ser. No. 307,405, Nov. 17, 1972, abandoned. This application Nov. 17, 1975, Ser. No. 632,218

Int. Cl.² F25J *3/08*; C01B *23/00*; G21C *15/28*; C09K *5/00*

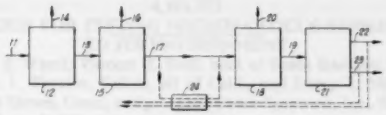
U.S. Cl. 176—37 **6 Claims**

1. A method of producing isotopically enriched helium-4 which comprises removing by distillation helium-3 from liquefied natural gas source helium, said removal being accomplished at a temperature between about 4.2° K and about 5.1° K, and at a pressure equal to the equilibrium pressure of the system.

3. A method for more safely and efficiently cooling a high-temperature, gas-cooled nuclear reactor comprising:

liquefying natural gas source helium;

subjecting the liquefied natural gas source helium to distillation carried out at a temperature of between about 4.2° K and about 5.1° K, and at a pressure equal to the equilibrium pressure of the system, to separate, by such distillation, and through the removal of the helium-3 isotope in



the course of the distillation, the liquefied natural gas source helium into an isotopically enriched helium-4 fraction containing less than about 0.17 ppm of helium-3, and an isotopically denuded helium-4 fraction; and

circulating at least a portion of the isotopically enriched helium-4 fraction through the high-temperature, gas-cooled nuclear reactor to provide at least a portion of the coolant gas therefor.

4,101,376
TUBULAR HEATER FOR CRACKING HYDROCARBONS

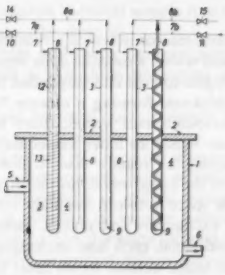
Gerhard Cornelius, Bergen-Enkheim; Heinz Jockel, Klein-Gerau, and Hans Küpfer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 552,507, Feb. 24, 1975, abandoned. This application Sep. 17, 1976, Ser. No. 724,125

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1974, 2412840

Int. Cl.² G21C *1/00*

U.S. Cl. 176—39 **8 Claims**



1. Reactor for reacting a gaseous mixture of gaseous or vaporized hydrocarbons with water vapor to produce a product gas of carbon monoxide and hydrogen-containing gases at temperatures above 700° C and under pressure of 5–80 kg/cm² comprising a heating zone and reaction tube means receptive of a heating fluid which consists of a gas at a temperature above 800° C for indirectly heating same in the heating zone comprising a plurality of tubes each having a first portion extending into the heating zone and surrounded by the heating fluid in a heating zone, a second portion positioned outside the heating zone, feed conduit means for feeding the gaseous mixture therein and discharge conduit means for discharging product gas, each reaction tube having a closed end within said heating zone, each discharge conduit means extending longitudinally through the first and second portions of its respective reaction tube almost to the tube end and being open at its end within said reaction tube, a gas permeable material disposed in the second portion of each tube in the annular space around the discharge conduit means to promote heat transfer and catalyst

material disposed in the first portion of each tube in the annular space around the discharge conduit means whereby the gaseous mixture to be reacted is fed to each reaction tube, flowing therethrough, through the gas permeable material, undergoing reaction therein to form the product gas which then flows through the discharge conduct means contercurrent to the direction of flow through the gas permeable material.

4,101,377

FAST NEUTRON REACTOR

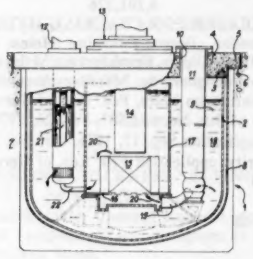
Jean-Marie Berniolles, Pierrevert, and Patrick Jogand, Aix en Provence, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 25, 1977, Ser. No. 781,428

Claims priority, application France, Mar. 29, 1976, 76 09082; May 4, 1976, 76 13275

Int. Cl.² G21C *15/00*

U.S. Cl. 176—40 **10 Claims**



1. A fast neutron reactor in which a volume of liquid coolant metal is contained within a metallic main vessel having a vertical axis and an open-topped end suspended from a shield roof of substantial thickness forming a closure for a containment vault which surrounds said vessel, there being also placed within said main vessel an inner vessel having a cylindrical wall for containing the reactor core which is immersed beneath the level of the liquid metal, provision being made within the intermediate space between the main vessel and the inner vessel for heat exchangers and pumps immersed beneath the level of the liquid metal, each heat exchanger being such as to have an annular shape defined by an inner shell and an outer shell in parallel relation and provided with plurality of heat-transfer tubes extending vertically over the greater part of their length, said tubes being in contact externally with the liquid metal which passes through the heat exchanger and arranged in concentric rings between the two shells, said tubes being such as to have their openings in two end tube-plates which delimit with the two shells of the heat exchanger two manifolds consisting respectively of an inlet manifold at the lower end of the heat exchanger and an outlet manifold at the upper end for a heat-transfer fluid which serves to collect the heat gained by the liquid metal as it passes through the reactor core, wherein the inner shell surrounds a central feed duct having a vertical axis and joined to the inner vessel and wherein the annular space between the two shells communicates at the upper end thereof with a flared portion of the central duct through a first circular window formed in the inner shell and at the lower end thereof with the region located between the inner vessel and the main vessel through a second circular window formed in the outer shell.

4,101,378

PROCESS FOR THE MICROBIOLOGICAL OXIDATION OF STEROIDS

Daikichiro Nishikawa, Tokyo; Yukio Imada; Masayuki Kinoshita, both of Yokohama; Katsuhiko Takahashi, Kawasaki; Hajime Machida, Tokyo, and Michitaro Nagasawa, Noda, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Noda Institute for Scientific Research, Chiba, both of, Japan

Division of Ser. No. 693,685, Jun. 7, 1976, Pat. No. 4,057,469. This application Aug. 15, 1977, Ser. No. 824,902

Claims priority, application Japan, Jun. 6, 1975, 50-68379; Sep. 22, 1975, 50-114431

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.² C07B *29/02*

U.S. Cl. 195—51 G **19 Claims**

1. In a process for the production of 17-hydroxyandrosta-1, 4-dien-3-one and/or androsta-1,4-diene-3,17-dione by fermenting a sterol, its 4-en-3-one sterol derivative or its 1,4-dien-3-one sterol derivative in a culture medium with a microorganism capable of microbiologically oxidizing said sterol or its derivatives to produce 17-hydroxyandrosta-1, 4-dien-3-one and/or androsta-1,4-dien-3,17-dione, the improvement which comprises adding to the culture medium at least one glyceride-containing substance selected from the group consisting of glycerides, fats, oil seeds and oil fruits in an amount sufficient that the culture medium contains at least 0.3 percent by weight of glycerides.

4,101,379

ENZYME COMPLEX HYDROLYZING BACTERIAL MUCUS

Philippe Gerard Marie-Joseph Boidin, Phalempin; Raoul Louis Andre Cassaigne, Cappelle-en-Pevele; Bernard Albert Victor Colein, Houplin-Ancoisne, and Robert Louis Felix Delecourt, Seclin, all of France, assignors to GB Fermentation Industries, Inc., Kingstree, S.C.

Filed Jan. 4, 1977, Ser. No. 756,669

Claims priority, application France, Jan. 22, 1976, 76 01729

Int. Cl.² C12D *13/10*

U.S. Cl. 195—62 **6 Claims**

1. A process for preparing complex enzymes capable of hydrolyzing bacterial mucus, comprising the following steps: inoculating a fermenatation medium with a Bacillus subtilis ATCC No. 31,182, causing fermentation of said medium while monitoring development of said complex enzymes in the fermentation medium, and suddenly stopping fermentation when the activity of complex enzymes in the medium reaches its maximum.

5. An enzyme complex capable of hydrolyzing bacterial mucus and containing a high endo-N-acetylhexosaminidase activity and produced by the process of claim **1**.

4,101,380

PROCESS FOR THE CROSS-LINKING OF PROTEINS

Menachem Rubinstein, Kiryat Ono; Shulamit Simon, Ramat-Gan, both of Israel, and Rene Bloch, deceased, late of Savion, Israel (by Rachel Bloch, administratrix), assignors to Research Products Rehovot Ltd., Rehovot, Israel

Filed Jun. 11, 1976, Ser. No. 695,030

Claims priority, application Israel, Jun. 12, 1975, 47468

Int. Cl.² C07G *7/02, 7/00*

U.S. Cl. 195—63 **31 Claims**

1. A process for the cross-linking of proteins wherein the proteins to be cross-linked are reacted with a cross-linking agent selected from the group consisting of:

(a) water soluble poly(ethylene oxide) derivatives of the general formula I

$$(Z)_m—Y—(CH_2CH_2O)_nCH_2CH_2—Y—(Z)_m \quad (I)$$

wherein both n and m are at least 1; Y is a covalent bond or is an —R— or —RO— radical in which the oxygen is bound to

the poly(ethylene oxide) and R is selected from the group consisting of methylene, ethylene, propylene, o—, m— and p-phenylene, o—, m— and p-phenylene carbamate optionally substituted by one or more alkyl, aryl, halo, nitro, oxo, carboxy, hydroxy, thio, sulfonate and phosphate groups; and Z is a reactive group selected from the groups consisting of haloisocyanato-, isothiocyanato-, tosylate, acyl halides, acyl azides, aryl diazonium salts, acyl imidoester salts, activated esters of acyl residues and 2,4-dichlorotriazines; and

(b) activated esters of di- and poly-carboxylic acids wherein the acids and the alcohol moieties thereof are water soluble, and wherein the alcohols forming the activated esters are selected from the group consisting of N-hydroxysuccinimide, 1-hydroxy benzotriazole, 8-hydroxyquinoline and 2- and 4-thiopyridine.

4,101,381

METHOD AND REAGENT FOR THE DETERMINATION OF SUBSTANCES FORMING HYDROGEN PEROXIDE

Sigmar Klose, Berg; Ulfert Deneke, Peissenberg; Erich Haid, Weilheim, and Gunter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Dec. 27, 1976, Ser. No. 754,878

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1976, 2600526

Int. Cl.[2] G01N *33/00, 31/14*

U.S. Cl. 195—99 **14 Claims**

1. Method for the quantitative determination of a substance which forms H_2O_2 with oxygen under the action of an oxidase, which comprises treating the H_2O_2 formed with methanol and catalase to yield formaldehyde, reacting the formaldehyde with 3-methyl-2-(sulfonyl)-benzothiazolone-hydrazone in the presence of an oxidizer, and photometrically determining the dye formed thereby as a measure of the said substance initially present.

4,101,382

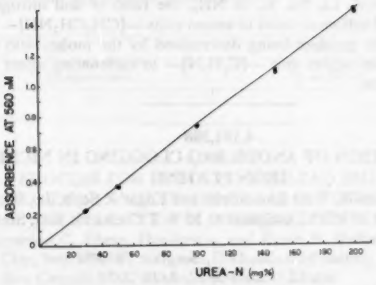
NOVEL RFAGENT AND METHOD FOR THE DETERMINATION OF UREA IN BIOLOGICAL FLUIDS

Moon Ki Chang, 1262 Barrington Ave., Apt. 105, Los Angeles, Calif. 90025

Division of Ser. No. 519,600, Oct. 31, 1974, Pat. No. 3,950,226. This application Dec. 5, 1975, Ser. No. 638,272

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 UR **6 Claims**



1. The method of determining the urea level in urea-containing fluids which comprises:

1. adding in one step a specimen of said fluid to an aqueous solution of a buffer, a pH indicator dye, a stabilizer of the solution, and measuring the absorbence of the resulting solution,
2. adding urease to the above resultant solution and measuring the absorbence of the final solution after the hydrolysis of urea by urease has gone to completion, and
3. calculating the amount of urea in the unknown sample by comparing the change in absorbance of the specimen with the change in absorbance obtained from subjecting specimens containing known amounts of urea to steps 1 and 2.

4,101,383

PROCESS FOR TESTING MICROPARTICLE RESPONSE TO ITS ENVIRONMENT

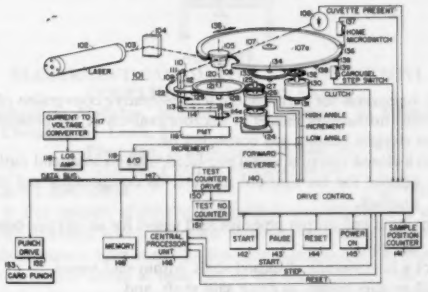
Philip J. Wyatt; Vincent R. Stull, both of Santa Barbara; William L. Proctor, Goleta, all of Calif., and Irving L. Miller, New Haven, Conn., assignors to Science Spectrum, Inc., Santa Barbara, Calif.

Division of Ser. No. 468,992, May 10, 1974, Pat. No. 3,928,140. This application Dec. 12, 1975, Ser. No. 640,195

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—103.5 R **26 Claims**



1. A process for determining the minimal inhibitory concentration (MIC) of a given bacterial sample to a selected chemical agent comprising the steps of:

A. preparing from said given bacterial sample a bacterial control sample in a medium promoting growth of bacteria;

B. incubating said bacterial control sample for a period of time sufficient for metabolism to occur;

C. inserting said sample into the path of an incident narrow, substantially monochromatic beam of radiant energy;

D. measuring the intensity of radiant energy scattered by said sample at plurality of angular locations about said sample relative to the direction of said incident beam sufficient to derive a control differential scattering pattern produced by said sample;

E. preparing from said given bacterial sample a bacterial test sample including a predetermined concentration, X, of a selected chemical agent in a medium promoting growth of bacteria;

F. incubating said bacterial test sample for substantially the same period of time and under substantially the same conditions as the bacterial control sample;

G. inserting said test sample into said beam path;

H. measuring the intensity of radiant energy scattered by said test sample at substantially the same angular locations about said test sample to derive a test differential scattering pattern produced by said test sample;

I. comparing said test and control patterns to yield a score, S, indicative of the effects of the chemical agent upon bacterial growth and upon bacterial morphology; and,

J. determining the MIC value, V (S, X), from the score, S, and the predetermined concentration, X, of the selected chemical agent.

4,101,384

APPARATUS FOR THE FERMENTATIVE CONVERSION OF A NUTRIENT MIXTURE BY MEANS OF MICROORGANISMS

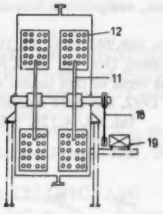
Uwe Faust, Fischbach; Rudolf Knecht, Dortmund-Aplerbeck; Wolfgang Lautenschlager, Wersau, and Wilhelm Wengeler, Bochum-Stiepel, all of Fed. Rep. of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 629,098, Nov. 5, 1975, abandoned. This application Jan. 26, 1976, Ser. No. 652,534

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1974, 2454443

Int. Cl.[2] C12B *1/16*

U.S. Cl. 195—142 1 Claim



1. Apparatus for carrying out a fermentative conversion of a nutrient mixture by means of microorganisms in the presence of an oxygen bearing gas consisting of:

(a) a closed reaction vessel provided with six inlet and outlet nozzles for the nutrient mixture, its components and the product,

(b) input and output pipes for said vessel for an oxygen-bearing gas,

(c) a horizontally disposed shaft within said vessel,

(d) motors means to drive said shaft, and

(e) a distributing device in the form of 2 paddle wheels each consisting of a circular disc and 8 flat paddles each of which has five rows of four holes evenly spaced thereon with each paddle equally spaced from each other and arranged radially on the disc and perpendicular to the axis of the disc, arranged on said shaft

so that each disc is perpendicular to the axis of said shaft and the axis of the said shaft passes through the center of each disc and the discs are so spaced that the paddles attached to the outer periphery of one disc do not touch the paddles attached to the outer periphery of another disc and

wherein the paddle wheels are so arranged that a small gap is provided between the outer end of each paddle wheel and the wall of the reactor vessel.

4,101,385

PROCESS FOR MAKING A METAL PLASTIC STRUCTURE

Daniel Luch, Warwick, N.Y., assignor to International Nickel Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,512

Int. Cl.[2] C25D *5/54, 5/56, 5/34*

U.S. Cl. 204—20 3 Claims

1. A process for electroplating at least part of the surface of a formed body comprising roughening said at least part of said surface, mechanically conforming and adhering a sheet of plateable plastic containing a polymer, carbon black and sulfur to said roughened surface and electroplating said adhered, conformed and plateable plastic sheet.

4,101,386

METHODS OF COATING AND SURFACE FINISHING ARTICLES MADE OF METALS AND THEIR ALLOYS

Richard Dötzer, and Klaus Stöger, both of Nüremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 300,906, Oct. 26, 1972, Pat. No. 3,969,195, which is a continuation-in-part of Ser. No. 249,279, May 1, 1972, abandoned. This application Jun. 1, 1976, Ser. No. 691,707

Claims priority, application Fed. Rep. of Germany, May 7, 1971, 2122610; Oct. 28, 1971, 2153831

Int. Cl.[2] C25D *5/34, 5/42, 5/44*

U.S. Cl. 204—32 R 1 Claim

1. In a process of electroplating a metal article, the improvement of pre-treating the surface of said article by impinging an anhydrous, aprotic liquid against the surface of said article by falling drops for the purpose of removing scale and exposing bright metal, and subsequently electroplating said article in an aprotic organo-metal liquid electroplating electrolyte essentially devoid of water and molecular oxygen.

4,101,387

COMPOSITION FOR ELECTRODEPOSITION OF METAL DEPOSITS, ITS METHOD OF PREPARATION AND USES THEREOF

Hans-Gerhard Creutz, Yale; Roy Wilbur Herr, Troy, and Richard Marshall Stevenson, Grosse Point Woods, all of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 462,683, Apr. 22, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,563

Int. Cl.[2] C25D *3/56, 3/12, 3/22, 3/20*

U.S. Cl. 204—43 T 5 Claims

4. A process for electrodepositing a bright metallic finish selected from the group consisting of nickel, nickel-iron and zinc upon a substrate, comprising passing a current through an aqueous acidic bath including a polyelectrolyte, in which the polyelectrolyte is a reaction product of a polyethylenimine and a sulfonating agent which contains nitrogen substituted sulfamate groups as a integral part of the polymer chain, said nitrogen substituted sulfamate unit of the reaction product is represented by the formula:

$$-[CH_2CH_2N]-$$
$$\quad\quad|$$
$$\quad SO_3^{\ominus}M^{\oplus}$$

where M=H, Li, Na, K, or NH_4, the ratio of said nitrogen substituted sulfamate units to amino units $-[CH_2CH_2NH]-$ in the reaction product being determined by the molar ratio of the polymer repeat unit $-[C_2H_5N]-$ to sulfonating agent in the reaction.

4,101,388

PREVENTION OF ANODE BAG CLOGGING IN NICKEL IRON PLATING

Hyman Chessin, West Bloomfield, and Edgar J. Seyb, Jr., Berkley, both of Mich., assignors to M & T Chemicals Inc., Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,898

Int. Cl.[2] C25D *3/12, 3/20, 3/56*

U.S. Cl. 204—43 T 12 Claims

7. In an aqueous plating solution containing nickel compounds and at least one member selected from the group consisting of cobalt compounds and ferrous compounds, providing ions for electrodepositing nickel, cobalt, nickel-cobalt alloy, nickel-iron alloy, or nickel-cobalt-iron alloy, and containing an amount of oxalic acid break-down product the improvement comprising the presence of at least one cation selected from the group consisting of cations of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytter-

bium, and lutetium in single or combined concentration of 1.0 gram per liter to 10 grams per liter.

4,101,389

METHOD OF MANUFACTURING AMORPHOUS ALLOY

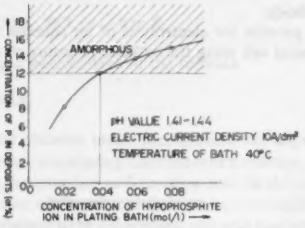
Satoru Uedaira, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,241

Claims priority, application Japan, May 20, 1976, 51-58305; Feb. 5, 1977, 52-11876

Int. Cl.² C25D *3/56*

U.S. Cl. 204—44 **13 Claims**


AMORPHOUS
pH VALUE 1.41-1.44
ELECTRIC CURRENT DENSITY 10A/dm²
TEMPERATURE OF BATH 40°C
CONCENTRATION OF HYPOPHOSPHITE ION IN PLATING BATH (mol/l)

1. A method of manufacturing an amorphous plated layer alloy consisting essentially of from 60 to 88 atomic percent iron and from 12 to 30 atomic percent phosphorous and up to 10 atomic percent nickel and/or cobalt comprising providing an acidic aqueous plating bath containing:

1/3 to 5/3 mole/l divalent iron ions

0.07 to 0.42 mole/l hypophosphite ions

and effecting the electroplating through the use of said bath under the following conditions:

pH	1.0 to 2.2
Current density	3 to 20A/dm²
Temperature	30 to 50° C

8. A method of manufacturing an amorphous plated layer alloy consisting predominantly of iron and phosphorous comprising providing an acidic aqueous plating bath containing:

1/3 to 5/3 mole/l divalent iron ions

0.07 to 0.42 mole/l hypophosphite ions

4×10^{-5} to 8×10^{-3} mole/l cupric ions

and effecting the electroplating through the use of said plating bath under the following conditions:

pH	1.0 to 2.2
Current density	3 to 20A/dm²
Temperature	30 to 50° C

4,101,390

PROCESS FOR PRODUCING A LEAD DIOXIDE COATED ANODE FROM A LEAD ELECTROLYTE WHICH CONTAINS DISSOLVED BISMUTH

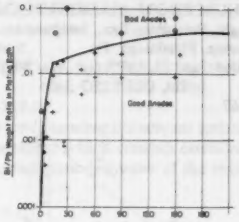
Raymond C. Rhees, Henderson, and Bruce B. Halker, Boulder City, both of Nev., assignors to Pacific Engineering & Production Company of Nevada, Henderson, Nev.

Division of Ser. No. 662,632, Mar. 1, 1976, Pat. No. 4,038,170. This application Jun. 3, 1977, Ser. No. 803,105

Int. Cl.² C25D *9/06*

U.S. Cl. 204—57 **14 Claims**

1. In a process for forming a coated anode containing lead dioxide, the process comprising electrodepositing a coating containing lead dioxide in a substrate anode, the electrolyte being acidic and containing an aqueous acid solution of a lead compound in a concentration and of the type capable of depositing lead dioxide on the substrate anode, the improvement comprising including in said electrolyte during coating of the lead dioxide on the substrate anode, bismuth in an amount to provide a ratio of bismuth to lead in said electrolyte of at least



$1:10^3$ and being sufficient to increase the current efficiency of the anode, or to decrease lead loss from the anode surface at temperatures of use below 25° C.

4,101,391

ELECTROLYTIC OXIDATIVE METHYL-METHYL COUPLING OF CRESOL SALTS

Richard C. Hallcher, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 5, 1976, Ser. No. 646,725

Int. Cl.² C25B *3/10*; **C07C** *69/16*

U.S. Cl. 204—59 R **20 Claims**

1. The process of electrolytic oxidative methyl-methyl coupling of cresol salts substituted with non-interfering, blocking substituents at least at the 2,4,6-positions relative to the phenolic oxyanion where at least one of the substituents is the cresolic methyl, which process comprises electrolytic oxidation at the anode by electrolysis at no more than about 0.5 volts (versus the saturated calomel electrode) in a liquid electrolysis medium comprising such cresol salt and a substantially non-nucleophilic solvent, and thereafter recovering a methyl-methyl coupled dehydrodimeric cresol.

4,101,392

PROCESS FOR ELECTROLYTIC OXIDATIVE METHYL-METHYL COUPLING OF CRESOL SALTS

Richard C. Hallcher, Maryland Heights, and Manuel M. Baizer, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,652

Int. Cl.² C25B *3/10*

U.S. Cl. 204—59 R **21 Claims**

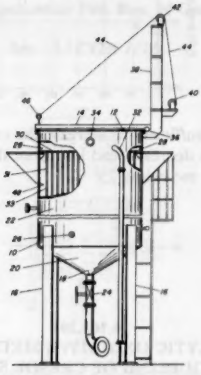
1. An improved process for electrolytic oxidative methyl-methyl coupling of cresol salts substituted with non-interfering, blocking substituents at least at the 2, 4, 6-positions relative to the phenolic oxyanion where at least one of the substituents is the cresolic methyl, which process comprises electrolytic oxidation at the anode by electrolysis at no more than about 0.5 volts (versus the saturated calomel electrode) in a liquid electrolysis medium comprising the cresol salt, the corresponding free cresol, and a substantially non-nucleophilic solvent, wherein the molar equivalent ratio of cresol salt to free cresol is no more than about 1.0 molar equivalent of cresol salt to about 5.0 molar equivalents of free cresol, and thereafter recovering a methyl-methyl coupled dehydrodimeric cresol.

4,101,393

METHOD OF CLEANING FILTER BAGS IN A SYSTEM FOR EFFLUENT GAS RECYCLING AND RECOVERY FROM ELECTROLYTIC CELLS FOR PRODUCTION OF ALUMINUM FROM ALUMINUM CHLORIDE

Robert L. Hargis, Palestine, Tex., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 22, 1977, Ser. No. 808,780
Int. Cl.[2] C25C 3/06
U.S. Cl. 204—67 2 Claims



1. In a process for electrolysis of aluminum chloride wherein effluent gases contain particles of aluminum chloride and aluminum chloride combinations, said particles are separated from the effluents and accumulate in a filtering means of a separating means, the improvement comprising:

transferring said filtering means having the particles thereon as an assembled unit from said separating means to a vessel for cleaning;

placing said filtering means inside the vessel and sealing the vessel from the environment;

flowing water at a temperature of from 5° to less than 100° C into the lower portion of the vessel until said filtering means is completely immersed therein;

permitting the water to react with the particles on said filtering means; and

exhausting gaseous products of reaction from the upper portion of the vessel and exhausting water and products of reaction contained in the water from the lower portion of the vessel thereby cleaning said filtering means.

4,101,394

ELECTROLYTIC METHOD

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 575,915, May 9, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,308
Int. Cl.[2] C25B 1/26, 1/02, 3/04
U.S. Cl. 204—77 18 Claims

14. A method of producing chlorine and alcohol comprising the steps of:

feeding hydrochloric acid to an anolyte chamber of an electrolytic cell;

feeding a water soluble organic oxidant having a reducible peroxy bond to a catholyte chamber of said cell at a rate sufficient to suppress hydrogen evolution at the cathode;

passing an electrical current from an anode of said cell to a cathode of said cell whereby chlorine is evolved at the anode and the organic oxidant is reduced in the catholyte; and

recovering chlorine from the anolyte chamber and the reduction products of the organic oxidant from the catholyte chamber.

4,101,395

CATHODE-STRUCTURE FOR ELECTROLYSIS

Kensuke Motani; Toshikatsu Sata, and Masakatsu Nishimura, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Filed Aug. 30, 1976, Ser. No. 718,769
Int. Cl.[2] C25B 1/46, 11/03, 13/08
U.S. Cl. 204—98 9 Claims

1. A cathode-structure for liquid-phase electrolysis of an aqueous solution of an alkali metal salt comprising a perforated cathode and a polymer containing cation exchange groups in its molecule, said cathode being electrochemically inactivated on one surface, thereof said polymer being laminated in the form of a film on said electrochemically inactivated surface of said cathode.

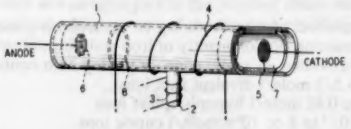
8. A process for electrolysis of an aqueous solution of an alkali metal salt using the cathode structure of claim 1.

4,101,396

ISOTOPE ENRICHMENT BY RESONANCE TRAPPING

William Thomas Silfvast, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1976, Ser. No. 753,707
Int. Cl.[2] B01J 1/10; B01D 53/00
U.S. Cl. 204—157.1 R 20 Claims



1. A method of altering the isotopic composition of a quantity of an element comprising the steps of:

producing a quantity of elemental vapor from a feedstock quantity of the element in such a manner that the partial pressure of the vapor generated is substantially equal to a predetermined value, whereby the trapping factor of a less-abundant isotope is greater than the trapping factor of a more-abundant isotope;

mixing said vapor with a buffer gas having an ionization potential greater than the ionization potential of said element;

passing a direct current electric discharge through the mixture of said vapor and said buffer gas, which electric discharge excites resonant states of said vapor, whereby the phenomenon of resonance trapping produces a higher proportion of excited atoms in the more-abundant isotope than in the less-abundant isotope;

ionizing preferentially those atoms which have been excited to said resonant states, and

removing the ions so produced from said mixture, whereby the material removed contains an enhanced proportion of the more-abundant isotope relative to the proportion in the feedstock and the residue contains an enhanced proportion of the less-abundant isotope relative to the proportion in the feedstock.

4,101,397
PROCESS FOR THE PREPARATION OF ALPHA-CHLOROMETHYLSILANES

Hans-Joachim Kötzsch; Gerhard Müller, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,372
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614197
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 HA 9 Claims

1. In a process for the preparation of an α-chloromethylsilane of the general formula

$$ClCH_2(CH_3)_{3-n}SiCl_n \ (n = 0 \text{ to } 3) \qquad II$$

by contacting a methylsilane of the formula

$$(CH_3)_{4-n}SiCl_n \qquad I$$

with elemental chlorine under illumination, the improvement which comprises introducing chlorine into a reaction zone at a constant rate, maintaining said reaction zone in the vicinity of the boiling point of the methylsilane to be chlorinated, introducing methylsilane to be chlorinated into said reaction zone at such a rate so as to maintain the temperature of the reaction mixture in the vicinity of the boiling point of the methylsilane to be chlorinated and continuously withdrawing reaction product at such a rate that the concentration of chloromethylsilane in the reaction product amounts to up to 18 percent by weight.

4,101,398
PROCESS FOR HARDENING A RESIN WHICH IS THE REACTION PRODUCT OF AN EPOXY RESIN, AN OLEFINICALLY UNSATURATED MONOCARBOXYLIC ACID AND A POLYCARBOXYLIC ACID ANHYDRIDE UNIT

Wolfgang Hesse, Wiesbaden, and Paul Jacobi, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 487,983, Jul. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 239,332, Mar. 29, 1972, abandoned. This application Jul. 2, 1976, Ser. No. 702,352
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1971, 2115918
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.16 16 Claims

1. A process for hardening (I) a resin which is the reaction product of a first reaction of a) an epoxy resin which contains at least two epoxy groups, with b) an olefinically unsaturated monocarboxylic acid followed by a reaction of free hydroxyl groups formed from the epoxidecarboxylic acid reaction with c) a polycarboxylic acid anhydride unit, by copolymerising said resin (I) with (II) a copolymerisable olefinically unsaturated monomer under the action of irradiation of an electron beam of a minimum radiation dose of 0.25 Mrad/g of reaction product, one polycarboxylic acid anhydride unit being attached to at least two molecules of the epoxy resin, the number of epoxy groups being approximately equal to the sum of the number of free carboxyl groups and the number of anhydride groups of the polycarboxylic acid anhydride units, the epoxide being in the proportion of about 1.25 to 1.5 equivalents of epoxide per equivalent of unsaturated monocarboxylic acid and about 0.25 to 0.5 mol of polycarboxylic acid anhydride units.

4,101,399
PRODUCTION OF SOLVENT RESISTANT BROMINATED AND/OR CHLORINATED AROMATIC POLYESTER FIBROUS MATERIALS

John R. Costanza, North Plainfield, and George L. Collins, New Providence, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,461
Int. Cl.[2] C08G *18/00*
U.S. Cl. 204—159.19 19 Claims

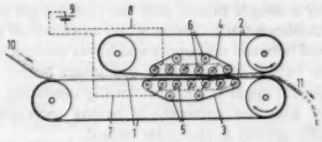
1. A process for enhancing the solvent resistance of a halogenated fibrous material which consists essentially of irradiating an aromatic polyester of the recurring structural formula

where X which may be the same or different is chlorine or bromine, Y which may be the same or different is hydrogen, chlorine or bromine, z is 4 and R and R′ may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, n = at least 10, by exposing said halogenated fibrous material to low intensity low energy ultraviolet light radiation of a wavelength which consists essentially of 1000 A to 3900 A, and a source intensity of from 100 to 400 watts per linear inch for a period of time not to exceed 10 seconds, said source intensity and duration of exposure being selected to achieve enhanced solvent resistance.

4,101,400
METHOD FOR DEWATERING SLUDGE

Roelf Pepping, Sneek, Netherlands, assignor to Machinefabriek W. Hubert & Co. B.V., Sneek, Netherlands

Continuation of Ser. No. 474,092, May 28, 1974, abandoned. This application May 20, 1977, Ser. No. 798,940
Claims priority, application United Kingdom, May 29, 1973, 25458/73
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 R 4 Claims



1. In a method of dewatering sludge having a dry content of less than 30% comprising continuously passing the sludge, on an endless belt member permeable to liquid, between electro-endosmosis electrodes and applying an electrical direct current through the sludge between the electrodes in a direction transverse to the direction of movement of the sludge, the improvement comprising:

preconditioning the sludge by flocculation with polymeric flocculants;

while the sludge is on the endless belt member and before the sludge is passed between the electro-endosmosis electrodes, pre-dewatering the sludge to shovel consistency; and

while the sludge is on the endless belt member, subjecting the sludge to mechanical pressure at least at locations during and after the passage of the sludge between the electro-endosmosis electrodes to a sufficient extent at each location to provide an amount of dewatering greater than

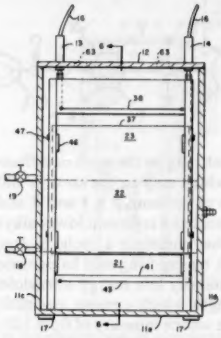
the amount achieved when the dewatering is accomplished with pressure applied only during passage of the sludge between the electrodes.

4,101,401

FLUID ISOLATION ELECTROPHORESIS APPARATUS AND METHOD

Stanton A. Hoefer, San Francisco, Calif., assignor to Hoefer Scientific Instruments, San Francisco, Calif.

Filed Mar. 11, 1977, Ser. No. 776,639
Int. Cl.² G01N *27/26*
U.S. Cl. 204—180 G **16 Claims**



1. Apparatus for electrophoretic separation of samples within a running gel, comprising

an outer container forming therein an upper buffer space, an intermediate space adjacent to said upper buffer space and a lower buffer space adjacent to said intermediate space, each of said spaces being in fluid communication with the adjacent space,

means for holding the running gel in vertical disposition within said outer container so that the running gel extends from said upper buffer, through said intermediate, to said lower buffer spaces,

an upper electrode disposed in said upper buffer space,

a lower electrode disposed in said lower buffer space,

and means for removing heat energy from said intermediate space,

whereby a sample placed atop the running gel is separated electrophorectially therein when an electrical potential is applied between said upper and lower electrodes, and said upper buffer, intermediate, and lower buffer spaces are filled with upper buffer, electrically insulating, and lower buffer solutions respectively having increasing relative specific gravity in the order named.

4,101,402

ADHERENCE OF METAL FILMS TO POLYMERIC MATERIALS

John Louis Vossen, Jr., Bridgewater, N.J.; Frederick Russell Nyman, Carmel, and George Frederick Nichols, Oaklandon, both of Ind., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 599,130, Jul. 25, 1975, Pat. No. 3,984,907.
This application Apr. 23, 1976, Ser. No. 679,842
Int. Cl.² C23C *15/00, 13/02*
U.S. Cl. 204—192 C **8 Claims**

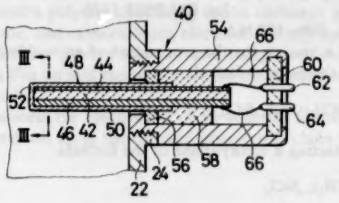
1. A method for improving the adhesion of nickel-chromium alloy films to polymeric materials wherein said alloy contains from about 65 to about 80 percent by weight of nickel, from about 10 to about 30 percent by weight of chromium and from 0 to about 10 percent by weight of iron which comprises sputtering a first thin layer of copper onto said polymeric material and sputtering a layer of said alloy onto said copper layer.

4,101,403

SENSOR FOR DETECTING VARIATION IN OXYGEN CONCENTRATION IN GAS

Toru Kita, and Takeshi Fujishiro, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 13, 1976, Ser. No. 749,899
Claims priority, application Japan, Dec. 18, 1975, 50/150129
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **10 Claims**



1. A sensor for detecting the occurrence of a fluctuation in the air/fuel ratio of an air-fuel mixture fed to an internal combustion engine across the stoichiometric air/fuel ratio by disposing the sensor in a stream of the exhaust gas of the engine, the sensor comprising:

a layer of an oxygen ion conductive solid electrolyte;

a support means for supporting the solid electrolyte layer such that at least a portion of said solid electrolyte layer can be exposed on both sides thereof to a stream of the exhaust gas;

porous and electron conductive first and second electrode layers of a metal having catalytic ability on oxidation reactions of carbon monoxide and hydrocarbons contained in the exhaust gas formed respectively on first and second sides of said solid electrolyte layer at least in regions exposable to the exhaust gas stream; and

porous first and second protective coatings of a refractory material formed respectively on said first and second electrode layers at least in regions exposable to the exhaust gas stream;

said first and second electrode layers and said first and second protective coatings being formed such that the total resistance offered by said first protective coating and said first electrode layer to the permeation of the exhaust gas therethrough is different from the total resistance offered by said second protective coating and said second electrode layer to the permeation of the exhaust gas therethrough, so that the exhaust gas comes into contact with said second side of said solid electrolyte layer with a time lag behind the contact of the exhaust gas stream with said first side of said solid electrolyte layer whereby establishing an electromotive force when a fluctuation occurs in the oxygen partial pressure of the exhaust gas resulting from a fluctuation in said air/fuel ratio, across said stoichiometric ratio, with the polarity of said electromotive force indicating whether the air/fuel ratio is increasing or decreasing.

4,101,404

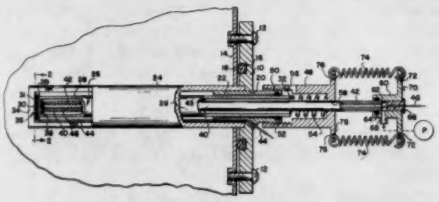
HOT GAS MEASURING DEVICE

Robert N. Blumenthal, 17470 Bard Ct., Brookfield, Wis. 53005, and Andreas T. Melville, 204 N. 86th St., Wauwatosa, Wis. 53226

Filed Jun. 28, 1976, Ser. No. 700,659
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **11 Claims**

10. In a gas measuring device for measuring a characteristic of high temperature gases, and having a solid electrolyte and means for mounting said electrolyte with a portion of its surface exposed to the gas which is to be measured, and having an electrode in contact with said exposed electrolyte surface and

spring means pressing said electrode and electrolyte together, the improvement wherein said electrode comprises at least two



open mesh screens made of electrically conductive material, said screens being mounted in face-to-face contact with each other transverse to the direction of action of said spring means.

4,101,405

SHAPING APPARATUS

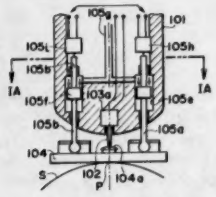
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research (IJR) Inc., Yokohama, Japan

Division of Ser. No. 228,155, Feb. 22, 1972, abandoned. This application Nov. 19, 1976, Ser. No. 743,519

Claims priority, application Japan, Feb. 19, 1971, 46-8312; Feb. 22, 1971, 46-8305; Feb. 22, 1971, 46-8306; Mar. 26, 1971, 46-18265; May 21, 1971, 46-34536; May 28, 1971, 46-36270

Int. Cl.[2] B23P *1/02, 1/12;* **B24B** *17/00;* **B23D** *5/0 4*

U.S. Cl. 204—224 M **15 Claims**



1. An apparatus for shaping a workpiece comprising:

a sensor adapted to scan a model and generating a plurality of signals defining a plane tangent to the surface of said model and the direction of curvature of said surface at a sensed point;

a workpiece support adapted to receive said workpiece;

a tool having an axis and juxtaposed with said workpiece;

a tool support carrying said tool; and

means connected with at least one of said supports and operatively connected with said sensor for relatively displacing said workpiece and said tool with respect to a multiplicity of axes for maintaining the tool axis normal to a contour generated in said workpiece by said tool, said sensor comprising a plurality of fingers biased in the direction of said model, respective mechanical/electrical transducers for converting the positions of each of said fingers into an electrical analog signal representing said position, said means connected to at least one of said supports including respective servomotors responsive to said signals.

4,101,406

SIMPLIFIED ELECTROLYTIC SYSTEM

G. Oscar Westerlund, Vancouver, Canada, assignor to Gow Enterprises Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 693,888, Jun. 8, 1976, Pat. No. 4,052,287. This application Jun. 29, 1977, Ser. No. 811,238

Claims priority, application Canada, Apr. 1, 1976, 249382

Int. Cl.[2] C25B *15/08, 9/00*

U.S. Cl. 204—239 **17 Claims**

1. A closed loop system for effecting an electrolysis reaction and for subsequently removing reacted products of electrolysis, including: (1) a multicell electrolyzer in the form of a generally rectangular parallelepiped vessel and comprising: (A) inlet means for fresh electrolyte thereto, and outlet means for electrolyte soluble ion and gaseous products of electrolysis therefrom, inlet means for recycled electrolyte and electrolyte soluble ion products of electrolysis thereto and outlet means for electrolyte soluble ion products of electrolysis therefrom; (B) a plurality of interconnected electrolytic cells provided with bipolar metal electrodes disposed in the path of the electrolyte flow between the fresh electrolyte inlet means and the electrolyte soluble ion and gaseous electrolysis products outlet means, one end wall providing an anodic terminal connection, the other end wall providing a cathodic terminal connection, with an anode bus bar connected to the anode terminal connection and a cathodic bus bar connected to the cathodic terminal connection, wherein the electrolyte soluble ion and gaseous electrolysis products outlet means are from an electrolytic cell whose electrical potential is about the same as that of an electrolytic cell to which the recycled electrolyte and electrolyte soluble ion products of electrolysis return, the cover of said electrolyzer sloping to provide increasing cross-sectional area in the direction from the fresh electrolyte inlet means to the electrolyte soluble ion and gaseous electrolysis products outlet means, the floor of said electrolyzer sloping to provide decreasing cross-sectional area in the direction from recycled electrolyte and electrolyte soluble ion products of electrolysis inlet means to the electrolyte soluble ion products of electrolysis outlet means; (C) a downwardly sloping front wall; (D) wedge means disposed between the electrodes and the front wall, thereby to hold the electrodes in place, and when thus assembled, to simplify installation and to minimize internal liquor spacing between electrodes; (E) removable cover means to provide said sloping cover; (F) a lower liquor distributing trough connected to the recycled electrolyte and electrolyte soluble ion products of electrolysis inlet means and disposed below the assembled bipolar electrode modules for distributing liquor to the interelectrode zones between said electrodes; (G) a top liquor distributing channel disposed above the assembled electrode modules and leading directly to the electrolyte soluble ion and gaseous electrolysis products outlet means; and (H) circulation means provided by internal pumping action due to the construction and arrangement of the electrodes and the rising gaseous products of the electrolysis; and (2) a reactor/-degasifier in the form of a generally upright cylindrical vessel and including (A) inlet means for electrolyte soluble ion and gaseous electrolysis products from said electrolyzer and outlet means near the bottom of said reactor for recycled electrolyte and electrolyte soluble icn products of electrolysis to said electrolyzer; (B) a pipe riser connected directly to said inlet means and discharging near the top thereof; (C) degasifier means disposed atop the reactor means, the degasifier means including an upper liquor-free zone having outlet means for the separated gaseous products of electrolysis and having an open bottom communicating with, or being, an opening at the top of said reactor for the introduction of electrolyte soluble ion and

gaseous electrolysis products into said degasifier means and for the recirculating of largely degasified electrolyte and electrolyte soluble ion products of electrolysis into said reactor; and (D) indirect cooling means for said reactor.

4,101,407

HORIZONTAL ELECTROLYZERS WITH MERCURY CATHODE

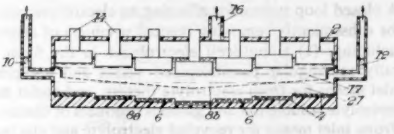
Pierre Hilaire, Grenoble, and Georges Lonchampt, Meylan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 28, 1977, Ser. No. 763,614

Claims priority, application France, Jan. 30, 1976, 76 03015

Int. Cl.[2] C25B *1/46, 1/40*

U.S. Cl. 204—251 **15 Claims**



1. A horizontal mercury cathode electrolyzer comprising:
a housing,
diaphragm means separating a lower cathode compartment and an upper anode compartment in said housing,
a plurality of parallel channels located in said cathode compartment and inclined at a slight longitudinal angle to the horizontal, said channels being vertically staggered with respect to each other,
means for delivering mercury to the upper end of each of said channels and for collecting and evacuating said mercury at the lower end of each said channel,
and anode means in said anode compartment,
said diaphragm means being approximately parallel to a plane passing through the longitudinal midlines of said channels and to said anode means.

4,101,408

COUNTERCURRENT EXTRACTION COLUMN FOR LIQUID-LIQUID EXTRACTION

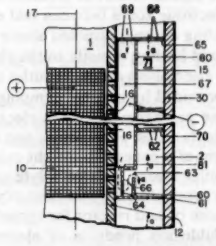
Helmut Schmieder, Karlsruhe; Hubert Goldacker, Hochstetten, and Werner Roos, Leimersheim, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Fed. Rep. of Germany

Filed Dec. 30, 1976, Ser. No. 757,062

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559337

Int. Cl.[2] C25C *7/00*

U.S. Cl. 204—272 **7 Claims**



1. In a countercurrent extraction column for a liquid-liquid extraction of two phases which are insoluble in each other, with simultaneous electrolysis, including: an outer tube, an inner tube within said outer tube, said inner tube dividing said column into an inner anode chamber and an outer cathode chamber which encloses the anode chamber without the use of a diaphragm, a plurality of bores establishing communication between said anode chamber and cathode chamber, an anode in said anode chamber, a cathode in said cathode chamber; the improvement comprising a hollow sheet metal cylinder around the inner tube in the area of the bores between the cathode chamber and the anode chamber, said cylinder acting as a cathode cylinder member and being chargeable in its interior by one of the phases through bores located at the top of the cylinder, and a plurality of radially inwardly extending sheet metal strips which are attached to the interior surface of said cylinder and which are distributed over the circumference of the cylinder.

4,101,409

ELECTROLYTIC FLOTATION APPARATUS

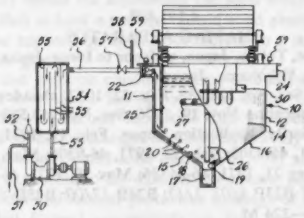
Eric Paul Austin, Sandbach, England, assignor to Simon-Hartley Limited, Staffordshire, England

Filed Apr. 25, 1977, Ser. No. 790,807

Claims priority, application United Kingdom, May 12, 1976, 19515/76

Int. Cl.[2] C02B *1/82, 1/20*

U.S. Cl. 204—277 **2 Claims**



1. Apparatus for the treatment of a liquid comprising a tank equipped with at least one electrode assembly in the base thereof for the generation of gas bubbles by electrolytic action, means for supplying the liquid to be treated to the tank for flow therethrough, means for collecting the treated liquid from the tank and means for gathering thickened material which collects on the surface of the liquid within the tank, characterised in that the means for supplying the liquid to be treated to the tank includes a line having a high pressure section and a low pressure section separated by a pressure reducing valve located immediately prior to the connection between said line and the tank, means for pumping the liquid through the line and means for bleeding air into the high pressure section of the line.

4,101,410

ELECTRODE ASSEMBLY WITH FLEXIBLE GAS BAFFLE CONDUCTOR

Morton S. Kircher, Eaton, N.Y., and Maynard F. Engler, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

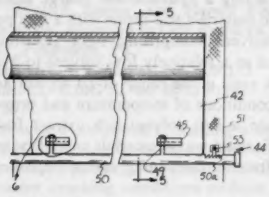
Filed Sep. 26, 1977, Ser. No. 836,458

Int. Cl.[2] C25B *13/00, 11/03, 9/00*

U.S. Cl. 204—282 **22 Claims**

1. An electrode assembly which comprises:
a. a vertically inclined common electrode conductor bar;
b. at least two opposed electrode working faces; and
c. movable, electrically-conductive, downwardly opening, gas baffle means for connecting said faces to said conduc-

tor bar, for biasing said working faces away from one another and for redirecting flow of gases between said



working faces from an upward to a primarily sideways direction parallel to said faces.

4,101,411

PLASMA ETCHING APPARATUS

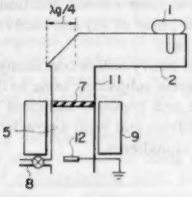
Keizo Suzuki; Sadayuki Okudaira, both of Kokubunji; Ichiro Kanomata, Fuchu, and Noriyuki Sakudo, Ohme, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1977, Ser. No. 787,878

Claims priority, application Japan, Apr. 15, 1976, 51-42787; Apr. 15, 1976, 51-42788

Int. Cl.² C23C *15/00*; B01K *1/00*

U.S. Cl. 204—298 **7 Claims**



1. In a plasma etching apparatus comprising:
microwave generator means;
waveguide means coupled to said generator for propagating microwaves therefrom;
a discharge area;
coupling means for introducing the microwave power from said waveguide into said discharge area;
magnetic field supplying means for applying an external magnetic field to said discharge area; and
gas supply conduit means to introduce a discharge gas into said discharge area;
whereby the surface of a substrate disposed in said discharge area is processed by ions, radical atoms and radical molecules in a plasma produced within said discharge area;
the improvement wherein said coupling means comprises a round waveguide means to introduce the microwave power and wherein said discharge area is provided within said round waveguide.

4,101,412

PROCESS AND APPARATUS FOR RAPID PYROLYSIS OF CARBONACEOUS MATERIALS

Charles K. Choi, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,049

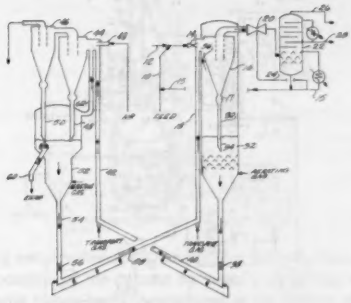
Int. Cl.² B01D *45/12*; C10B *49/16, 55/08*; C10G *1/00*

U.S. Cl. 208—8 **30 Claims**

1. In a process for the pyrolysis of carbonaceous materials wherein the carbonaceous material is primarily pyrolyzed by heat transferred thereto from a high temperature, particulate solid source of heat to yield as products of pyrolysis, a pyrolytic vapor including condensible and noncondensible hydrocarbons and a particulate carbon containing solid residue, the improved method of achieving rapid pyrolysis which comprises:

(a) tangentially introducing to and passing along the path formed by the curved inner surface of a cyclone reaction separation zone having a vapor outlet at one end and a solids outlet at the base thereof, a high velocity stream of carbonaceous material, while;

(b) introducing into the high velocity stream of carbonaceous material at about the entrance of said cyclone reaction separation zone a high velocity, high temperature stream of the particulate solid source of heat contained in a carrier gas which is nondeleteriously reactive with re-



spect to the products of pyrolysis at an angle inclined to the path of travel of said carbonaceous material to penetrate and initiate pyrolysis of said carbonaceous material, the introduced quantity of particulate source of heat being sufficient to raise the carbonaceous material to a pyrolysis temperature of at least about 600° F while simultaneously;

(c) separating a gaseous mixture of the carrier gas and pyrolytic vapor from a solids mixture including the particulate solid source of heat and the carbon containing solids residue by the formation of a separate flow pattern of each mixture, the formed flow patterns being created by centrifugal forces induced at least in part by the high introduction velocities of each feed stream.

4,101,413

EXTRACTION OF COAL

William Derek Jones, Bredon, Nr. Tewkesbury; Geoffrey Michael Kimber, Cheltenham; James McLaren, Gotherington, and David Watkin Price, Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation-in-part of Ser. No. 626,845, Oct. 29, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,314

Claims priority, application United Kingdom, Nov. 8, 1974, 48448/74

Int. Cl.² C10G *1/04*

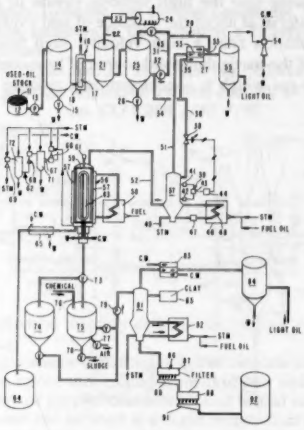
U.S. Cl. 208—8 **8 Claims**

1. A high boiling aromatic solvent oil for the solvent extraction of coal, produced by extracting a heavy petroleum material with a solvent which selectively removes the aromatic components which are suitable for use as a solvent for coal from the material, admixing the extract with an aromatic solvent selected from benzene, toluene and xylene, washing out with water the selective solvent from the admixture and recovering said aromatic components to form said solvent oil.

4,101,414
REREFINING OF USED MOTOR OILS

Yang J. Kim, Villa Park, and Belton R. Williams, Naperville, both of Ill., assignors to Unitech Chemical Inc., Chicago, Ill.

Filed Sep. 2, 1975, Ser. No. 609,183
Int. Cl.[2] C10G 7/00; C10M 11/00
U.S. Cl. 208—18 13 Claims

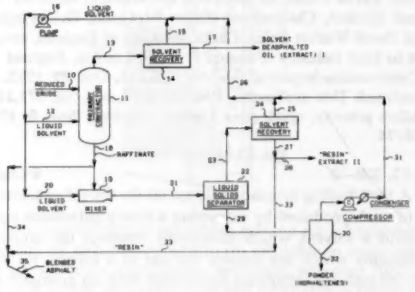


1. A method for rerefining used lubricating oils, comprising the steps of: predistilling a used oil stock by steam stripping said stock within the range of between about 480° F. and about 650° F. and below the cracking temperature thereof for at least 4 hours, said predistilling step removing NO_x gases, a light oil component and residual water from the stock to leave a predistilled stock; thereafter vacuum distilling the predistilled stock at below the cracking temperature thereof in a high vacuum environment, said vacuum distilling step including forming a thin film of the predistilled stock on a heated surface and wiping said film to assist in evaporating the stock and to avoid coking, fouling and buildup of impurities, and said vacuum distilling step including vaporizing a vacuum distilled stock to separate it from a viscous concentrate.

4,101,415
SOLVENT DEASPHALTING

Ralph P. Crowley, Woods Cross, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1977, Ser. No. 777,217
Int. Cl.[2] C10C 1/18, 3/08
U.S. Cl. 208—45 6 Claims



1. A process for producing a paraffinic-waxy fraction, a resin-naphthenic fraction, and a solids-asphaltene fraction from an asphalt-containing heavy hydrocarbon material which comprises the steps of:

(a) contacting a hydrocarbon charge stock containing asphaltic materials and resins with a first portion of a selective solvent comprising light paraffins and mixtures thereof at a relatively low solvent-to-hydrocarbon volumetric ratio in the range of 2:1 to 10:1 and under extraction conditions of temperature and pressure sufficient to separate a first solvent-rich extract fraction containing paraffins and waxy materials and a first solvent-lean raffinate fraction containing resins, naphthenes, and asphaltene,

(b) separating paraffinic waxy materials from said first solvent-rich extract phase and recovering a paraffinic waxy phase and solvent,

(c) contacting said first solvent-lean raffinate fraction with a second portion of said selective solvent at a solvent-to-hydrocarbon volumetric ratio higher than said ratio in (a) and at a temperature and pressure lower than in (a) such that asphaltic solids are formed in the presence of a large excess of solvent and that substantially all soluble materials are dissolved in a second solvent-rich extract phase,

(d) passing the admixture formed in (c) to a liquid-solids phase separation zone and allowing the admixture to phase separate into a heavy solids-containing phase and a solvent-hydrocarbon phase relatively free from asphaltenes,

(e) separating a resin extract fraction from said solvent-hydrocarbon phase of (d) and recovering a resin fraction and solvent, and

(f) passing said heavy solids-containing phase to a flashing zone and therein subjecting same to flashing conditions of temperature and pressure sufficient to separate residual solvent therefrom and yield a powdered asphaltic product comprising asphaltenes.

4,101,416
PROCESS FOR HYDROGENATION OF HYDROCARBON TARS

Geoffrey E. Dolbear, Diamond Bar, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,002
Int. Cl.[2] C10G 13/06; C07C 15/02
U.S. Cl. 208—108 18 Claims

1. A process for hydrogenation of hydrocarbon tars of high asphaltene content which comprises:

(a) forming a fluid solution of a hydrocarbon tar having an asphaltene content at least about 50% by weight in an aromatic hydrocarbon solvent for the hydrocarbon tar, said aromatic hydrocarbon solvent having a boiling point of from about 300° to about 750° F and formed as a product during the hydrogenation of the hydrocarbon tar to a hydrogen content of from about 1.2 to about 1.5 atoms of hydrogen per atom of carbon;

(b) hydrogenating the tars while maintaining a substantial portion of the solution in the liquid state in the presence of a hydrogenation catalyst and externally supplied hydrogen in an amount of at least about 3 times the amount of hydrogen consumed during hydrogenation at a temperature above about 500° F and a pressure from about 1500 to about 5000 psig for a time sufficient to react hydrogen with the tars and reduce the molecular weight of the tar constituents to form additional aromatic hydrocarbon solvent for the tars; and

(c) recovering at least a portion of the aromatic hydrocarbon solvent formed during the hydrogenation from the effluent of the hydrogenation zone and using the recovered aromatic hydrocarbon solvent in preparing the solution of hydrocarbon tar for feed to the hydrogenation zone.

4,101,417

METHOD OF NEGATING THE EFFECTS OF METALS POISONING ON ZEOLITIC CRACKING CATALYSTS

Bruce Richard Mitchell, Sarver, and Harold Eugene Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 4, 1976, Ser. No. 729,183
Int. Cl.[2] C10G *11/04*; B01J *8/24*
U.S. Cl. 208—120 6 Claims

1. In a process which comprises contacting a hydrocarbon feed with a zeolite-containing cracking catalyst containing at least 1,500 ppm nickel equivalents as metal contaminants in a cracking zone under cracking conditions without added hydrogen to produce a gasoline fraction; the improvement which comprises contacting said catalyst with a tin compound so as to deposit at least 2,000 ppm tin on said catalyst.

4,101,418

CATALYTIC REFORMING OF A NAPHTHA FRACTION

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 699,748, Jun. 24, 1976, Pat. No. 4,046,711. This application Jun. 6, 1977, Ser. No. 803,693
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 11 Claims

1. A process for the catalytic reforming of a naphtha fraction which comprises passing said naphtha fraction and hydrogen in contact with a germanium-promoted platinum group metal catalyst at reforming conditions, said catalyst having been prepared by impregnating a porous high surface area carrier material with a non-aqueous solution of a platinum group metal compound and a halo-substituted germane containing less than four halo substituents in an amount to provide a final catalyst containing from about 0.05 to about 1.0 wt. % platinum group metal and from about 0.05 to about 1.0 wt. % germanium, and drying and calcining the thus impregnated carrier materials, said platinum group metal compound being selected from the group consisting of chloroplatinic acid, platinum chloride, ammonium chloroplatinate, dinitrodiaminoplatinum, palladium chloride, chloropalladic acid, rhodium chloride, ruthenium chloride, ruthenium oxide, osmium chloride and iridium chloride.

4,101,419

SEPARATOR FOR SEPARATING HIGHER DENSITY METAL VALUES FROM EARTHEN MATERIAL

Thomas W. Bergman, R.F.D. Rte. 1, Morgan, Utah 84050

Continuation-in-part of Ser. No. 576,734, May 12, 1975, abandoned. This application Jun. 11, 1976, Ser. No. 695,238
Int. Cl.[2] B03B *5/62*
U.S. Cl. 209—13 10 Claims

9. A method for separating higher density metal values from lower density earthen materials comprising the steps of:

preparing a separator cone as a right conical surface and orienting the axis of the cone vertically with the cone being divergent upwardly;

attaching a transparent, hollow, cylindrical column to the apex of the cone so that the column is in fluid communication with the interior of the cone;

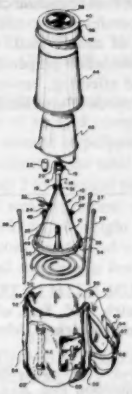
introducing water into the column and cone by diffusing at least a portion of the water into the column adjacent the lower end of the column;

screening a quantity of earthen material containing higher density metal values into the cone, the screen admitting only particles of a predetermined size into the cone;

visually observing the flow of particles into the column while regulating the flow of water diffusing into the column thereby separating higher density metal values from lower density earthen materials by forcing the lower density earthen materials upwardly in the cone with the water while allowing higher density metal values to fall downwardly into the column;

attaching a water-filled collection reservoir to the lower end of the transparent column in fluid communication with the column;

interposing a valve means between the column and the collection reservoir; and



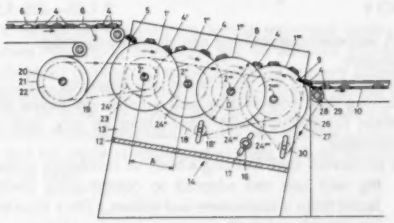
removing metal values from the column without disturbing the operation of the column by visually observing when the metal values have accumulated in the bottom of the column and opening the valve means thereby permitting the metal values to fall into the collection reservoir upwardly displacing water therein.

4,101,420

APPARATUS FOR ORIENTING AND SORTING ELONGATED ARTICLES

Pierre Luginbühl, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 31, 1977, Ser. No. 783,452
Claims priority, application Switzerland, Apr. 1, 1976, 4091/76
Int. Cl.[2] B07B *13/04*
U.S. Cl. 209—104 5 Claims



1. An apparatus for sorting and orienting elongated articles of predetermined length, comprising:

(a) at least two substantially horizontal shafts supported in a parallel-spaced relationship;

(b) a pair of axially spaced discs mounted on each shaft; the axial distance between the discs of any disc pair being less than said predetermined length; any successive two discs mounted on different shafts being in an overlapping relationship as viewed in a direction parallel to said shafts; each disc having a non-overlapping upper circumferential portion; the orientation of the circumferential portions of successive discs determining the direction of article feed;

(c) means for successively positioning articles on the first disc pair as viewed in said direction of article feed, in a

generally transverse orientation with respect to said direction of article feed; and

(d) means for driving said discs unidirectionally for effecting movement of each said circumferential portion in said direction of article feed for advancing each article successively on the circumferential portions of successive discs in said direction of article feed, effecting alignment of articles into an orientation perpendicular to said direction of article feed and effecting, between the discs of one of said disc pairs, dropout of articles shorter than said predetermined length.

4,101,421

CENTRIFUGE DRUM WITH LATERAL FILTRATION

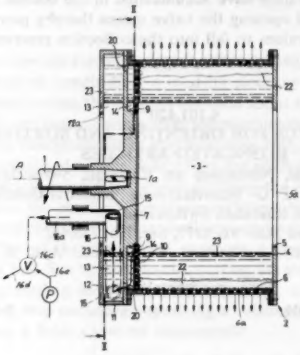
Günther Hultsch, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,171

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603610

Int. Cl.² B01D *21/26, 33/02*

U.S. Cl. 210—78 **8 Claims**



1. A suspension-separating centrifuge comprising:

a support;

a drum mounted for rotation on said support;

a driving shaft rotatable on said support and keyed to said drum for rotating said drum about an axis, said drum including

a perforated shell forming a body of revolution surrounding said axis and adapted to centrifugally discharge liquid from a suspension and collect a filter cake on the interior of said shell upon rotation of said drum,

a filter ring lying transversely of said shell at one axial end thereof, said ring lying in a plane substantially perpendicular to said axis and being formed with perforations, wall means lying transversely of said shell at the other axial end thereof, and

means on said drum forming an annular chamber of a radius at least equal to that of said ring and communicating with the interior of said drum through perforations formed in said ring; and

means for withdrawing liquid from said annular chamber, said annular chamber being formed as an inwardly open trough, said means for withdrawing liquid being a scoop tube displaceable on said support to extend to an adjustable depth into said trough and forming a liquid outlet for withdrawing liquid from said trough.

4,101,422

COPOLYESTERS USEFUL IN BLOOD SEPARATION ASSEMBLIES

James Lamont, and Robert J. Braun, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed May 11, 1977, Ser. No. 795,992

Int. Cl.² B01D *21/26*

U.S. Cl. 210—84 **4 Claims**

1. A method of separating the serum and clot portions of a blood sample which comprises centrifuging the blood in a blood separation assembly with a small but effective amount of an inert, homogeneous, hydrophobic copolyester having a 210° F viscosity of 2,000 to 8,000 centistokes, density in the range 1.015 to 1.060 g/cm³ and obtained by the reaction of essentially stoichiometric amounts of

(a) a saturated aliphatic dicarboxylic acid having 4 to 12 carbon atoms,

(b) a polymeric fatty acid containing 75% by weight or more C_{36} dibasic acid, and

(c) a branched-chain aliphatic dihydric alcohol having 3 to 8 carbon atoms, a mixture of said branched-chain dihydric alcohols, or a mixture containing at least 50% by weight said branched-chain aliphatic dihydric alcohols and a straight-chain aliphatic dihydric alcohol having 2 to 8 carbon atoms, the equivalents ratio of (a) to (b) ranging from 0.80:0.20 to 0.97:0.03, until the copolyester locates at the interface between the serum and clot portions and forms a continuous integral barrier therebetween.

4,101,423

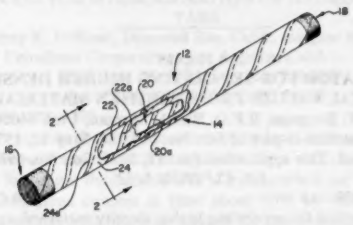
TUBULAR FILTRATION ELEMENT AND METHOD OF MAKING IT

Wayne S. Merrill, Nashua, N.H.; James H. Edwards, Winchester, and Bernard R. Danti, Lexington, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 565,094, Apr. 4, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,763

Int. Cl.² B01D *27/00, 29/06*

U.S. Cl. 210—494 M **8 Claims**



7. A fragile tubular filter element having the low resistance to liquid flow characteristic of a microporous membrane, that retains its tubular shape when not under load, for use for inside-to-outside liquid flow, that requires supportive engagement within a rigid, liquid-permeable, encasing support member for downstream hydraulic support when in use, said filter element comprising three substantially coextensive layers nested one within the other, said layers being disposed as an inner layer, an intermediate microporous layer, and an outer layer, each layer being formed from a separate, helically wound, thin web of liquid-permeable material, each layer having marginal edges that are disposed in overlapping relation, the confronting surfaces of the overlapped edges of the inner layer and of the intermediate microporous layer respectively being bonded to each other, said inner layer being formed from high wet strength paper that has sufficient rigidity to provide mechanical support for the element and being highly porous with a bubble point that is or approaches zero and being more permeable to liquid flow that the intermediate microporous layer, the intermediate microporous layer being formed from a fragile,

sterilizing grade, sterilizable, hydrophilic microporous membrane, the outer layer being formed from a finely porous plastic sheet material that has a low bubble point relative to that of the microporous membrane and that has a structure that permits lateral flow, the porosity of the inner and outermost layers being sufficiently great that the bubble point of the microporous membrane is not significantly affected, and two terminal rings of cured synthetic polymeric material, one at each of the ends of the tubular element respectively, said polymeric material being hydrophilic and impregnating the three layers at each of the ends of the element respectively and uniting them in a 3-dimensional monolithic polymeric ring structure that is reinforced by the impregnated end portions of the layers, without substantially affecting the bubble point of the microporous membrane, each of said rings sealing its respective end of the element against leakage when the element is in use, and each imparting mechanical strength to the element.

4,101,424

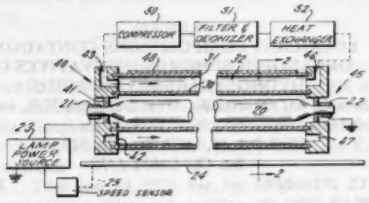
WATER JACKET FOR ULTRAVIOLET LAMP

Willard A. Schooley, Denville, N.J., and Robert E. Browne, E. Northport, N.Y., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 579,834, May 22, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,427

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—504 **18 Claims**



1. An ultraviolet lamp assembly for producing a generally focused band of ultraviolet radiation comprising, in combination:

an elongated ultraviolet radiation producing lamp having spaced terminals;

electrical power source means connected to said spaced terminals for energizing said lamp;

an elongated liquid-conducting jacket surrounding said lamp and being substantially coextensive with said lamp; said jacket being of a material which is substantially transparent to ultraviolet radiation;

a source of cooling liquid connected to said liquid-conducting jacket and circulating cooling liquid down the length of said jacket; said lamp being thermally coupled to said cooling liquid, whereby a portion of the heat produced by said lamp is transferred to said cooling liquid and is removed from the vicinity of said lamp;

means for deionizing said cooling liquid;

and elongated curved reflector means at least partly surrounding said lamp and intercepting at least a part of the radiation of said lamp and reflecting and generally focusing a part of said radiation into said generally focused band.

4,101,425

NON-AQUEOUS ACID EMULSION COMPOSITION AND METHOD FOR ACID-TREATING SILICEOUS GEOLOGICAL FORMATIONS

Donald C. Young, Fullerton, and George P. Maly, Newport Beach, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Apr. 21, 1975, Ser. No. 569,890

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—8.55 C **18 Claims**

1. A substantially anhydrous emulsion comprising: (1) about 5 to 95 weight percent of an acid component comprising (a) about 50 to 99 weight percent of polyphosphoric acid having about 5 to 86 weight percent of the total P_2O_5 present as polymeric P_2O_5, and (b) about 2 to 8 weight percent of hydrofluoric acid; (2) about 5 to 95 weight percent of an organic solvent component; (3) about 0.01 to 3.0 weight percent of an anionic or nonionic surfactant component; and wherein the H_2O/P_2O_5 mole ratio of the overall emulsion is less than 3.4.

4,101,426

ACID COMPOSITION AND METHOD FOR ACID TREATING GEOLOGICAL FORMATIONS

George P. Maly, Newport Beach, and Donald C. Young, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 496,144, Aug. 9, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,562

Int. Cl.[2] E21B *43/27*

U.S. Cl. 252—8.55 C **18 Claims**

1. An acid composition comprising a substantially anhydrous liquid mixture containing about 60 to 95 weight percent of polyphosphoric acid having about 40 to 86 percent of the total P_2O_5 present as polymeric P_2O_5, about 2 to 8 weight percent of hydrofluoric acid, and wherein the H_2O/P_2O_5 mole ratio of the overall acid mixture is less than 3.4.

4,101,427

LUBRICANT COMPOSITION

Harold Shaub, New Providence, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 9, 1977, Ser. No. 766,917

Int. Cl.[2] C10M *1/48, 3/42, 5/24, 0/46*

U.S. Cl. 252—32.7 E **9 Claims**

1. A lubricating composition having improved antifriction properties comprising a base oil and an additive mixture of from about 0.1 to about 1.5 grams of t-alkyl primary amine salt of dialkyldithiophosphate per 100 grams of base oil and from about 0.1 to about 5.0 grams, per 100 grams of base oil, of a metal dialkyldithiophosphate wherein said metal is a transition metal and the oxide of said metal exhibits a Mohs hardness of about 3 or more.

4,101,428

COMPOSITION COMPRISING A MIXTURE OF THE ZINC SALTS OF O,O-DI(PRIMARY AND SECONDARY) ALKYLDITHIOPHOSPHORIC ACIDS

John Crawford, Hornsea, England, assignor to Chevron Research Company, San Francisco, Calif.

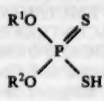
Filed Feb. 22, 1977, Ser. No. 770,866

Claims priority, application United Kingdom, Feb. 25, 1976, 7402/76

Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E **8 Claims**

1. A lubricant composition comprising a major amount of a lubricating base oil and from 0.001 to 15% by weight of a mixture of zinc salts of 0,0'-dialkyldithiophosphoric acids having the structural formula:



wherein R^1 and R^2 are the same or different and are either C_1 to C_{30} primary alkyl groups or C_4 to C_{20} secondary alkyl groups, and wherein said mixture is prepared by contacting a feedstock comprising a mixture of one or more C_1 to C_{30} primary alcohol(s) and one or more C_4 to C_{20} secondary alcohol(s) with phosphorus pentasulphide to form a mixture of 0,0'-dialkyldithiophosphoric acids and thereafter neutralising the mixture of acids by contact with zinc oxide, the secondary alcohol(s) forming not less than 25 mole percent of the feedstock mixture.

4,101,429

LUBRICANT COMPOSITIONS

August H. Birke, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 21, 1977, Ser. No. 817,875
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **6 Claims**

1. A lubricating oil composition comprising:

a major amount of an oil of lubricating viscosity and containing dissolved therein (1) from about 0.25 to about 1.75 weight percent of a zinc dialkyl dithiophosphate; from about 0.07 to about 0.5 parts per part by weight of said zinc dithiophosphate of a mixture of (a) a dimeric acid produced by the condensation of unsaturated aliphatic monocarboxylic acids having between about 16 and 18 carbon atoms per molecule, and (b) the reaction product obtained by reacting a monocarboxylic acid, a polyalkylene polyamine having more than one nitrogen atom per molecule, and an alkenyl succinic anhydride in a weight ratio of (a) to (b) from about 0.001 to 50 to about 15:0.001; and from 0.035 to about 0.25 parts of a substantially neutral zinc salt of a dialkylated aromatic sulfonic acid per part by weight of said zinc dithiophosphate.

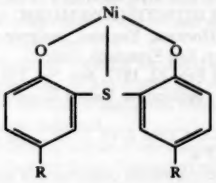
4,101,430

LUBRICANT COMPOSITIONS

Milton Braid, Westmont, and Samuel J. Leonardi, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 15, 1977, Ser. No. 768,925
Int. Cl.[2] C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **14 Claims**

1. A lubricant composition comprising a major amount of a lubricant base and a minor amount effective for stabilizing said composition against oxidative degradation of an organo-nickel complex having the structure



in which R is either hydrogen or an alkyl group having up to 30 carbon atoms.

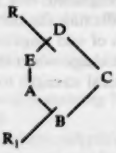
4,101,431

TURBINE LUBRICANT

Lawrence F. Kuntschik, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 12, 1977, Ser. No. 796,104
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—46.7 **10 Claims**

1. A vapor phase rust inhibited, oxidation stable, lubricating composition having improved air release properties and comprising in combination, a major amount of a mineral lubricating oil; a minor effective oxidation stabilizing amount of a heterocyclic antioxidant compound of the formula:



wherein R and R_1 are alkyl or aryl, straight or branched chain, or form a six membered ring and have one to 30 carbon atoms each; or can be absent and at least one member of the group ABCDE is carbon and at least three other members are selected from the group of nitrogen, oxygen and sulfur, a minor effective antifoaming amount of a polyacrylate anti-foaming agent, a minor effective vapor phase rust inhibiting amount of a C_8 to C_{10} monocarboxylic fatty acid, a minor work load improving amount of a mixture of synthetic tri(isopropylated phenol) phosphates, a minor effective antioxidant amount of a 2,6-ditertiary alkyl phenol antioxidant and a minor effective antirust amount of a phenol-free antirust concentrate consisting of oil-soluble polycarboxylic acids having alkyl groups of 6 to 30 carbon atoms and alkylacid orthophosphates.

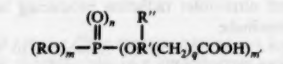
4,101,432

LUBRICANT COMPOSITIONS CONTAINING ORGANOPHOSPHORUS DERIVATIVES OF HYDROXYCARBOXYLIC ACIDS

Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

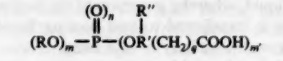
Filed Jul. 14, 1977, Ser. No. 815,630
Int. Cl.[2] C10M *1/10*
U.S. Cl. 252—49.8 **28 Claims**

1. A lubricant composition comprising a major amount of an oil of lubricanting viscosity or grease prepared therefrom and a minor load-carrying amount of a compound of the formula:



where R is alkyl of 1 to 32 carbon atoms, aryl or alkaryl and R' is alkylene or arylene and R'' is H, alkyl of 1 to 30 carbon atoms, aryl or alkaryl and where *n* is zero or 1 and *q* is zero or 1 to 30 and *m* and *m'* are 1 or 2 with the proviso that the sum of *m* and *m'* is 3.

17. A compound having the following general formula:



where R is alkyl of 1 to 32 carbon atoms, aryl or alkaryl and R' is alkylene or arylene and R'' is H, alkyl of 1 to 30 carbon atoms, aryl or alkaryl and where *n* is zero or 1 and *q* is zero or 1 to 30 and *m* and *m'* are 1 or 2 and the sum of *m* and *m'* equals 3.

4,101,433

COMPOSITION

Robert F. Purcell, and James R. Selleck, Jr., both of Terre Haute, Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Mar. 25, 1977, Ser. No. 781,250
Int. Cl.[2] C10M *3/04*
U.S. Cl. 252—49.5 4 Claims

1. A composition consisting essentially of tris(hydroxymethyl)nitromethane and P-1487 in a weight ratio of from about 0.7:1.3 of tris(hydroxymethyl)nitromethane to about 1.3:0.7 of P-1487, the latter consisting essentially of 4-(2-nitrobutyl)morpholine and 4,4'-(2-ethyl-2-nitrotrimethylene)dimorpholine in a ratio of 3.5:1, respectively.

4. A method of controlling the growth of bacteria and fungi in a petroleum-based cutting oil emulsion comprising the step of incorporating in the emulsion an amount of the composition of claim 1 sufficient to provide a concentration of from about 500 to 1500 ppm.

4,101,434

MINERAL OIL COMPOSITIONS WITH AN ISOBUTYLENE POLYMER CONTAINING BOUND 2,6-DI-t-BUTYL PHENOL GROUPS

Douglas Cameron Edwards, and John Walker, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 20, 1977, Ser. No. 789,236
Claims priority, application Canada, May 25, 1976, 253253
Int. Cl.[2] C10M *1/28*
U.S. Cl. 252—52 R 3 Claims

1. Improved mineral oil compositions comprising a major proportion of a mineral oil and from about 1 to about 20 weight percent of the total mineral oil composition of an isobutylene polymer containing bound at a terminal position from about 1 to about 20 weight percent of 2,6-di-t-butyl phenol groups attached to the isobutylene polymer at the 4-position of the aromatic phenol ring, the isobutylene polymer having an intrinsic viscosity as determined in toluene at 30° C of from 0.05 to 0.5 dl/g.

4,101,435

MAGNETIC IRON OXIDE-DEXTRAN COMPLEX AND PROCESS FOR ITS PRODUCTION

Masakatsu Hasegawa, Nagoya, and Syusaburo Hokkoku, Kani, both of Japan, assignors to Meito Sangyo Kabusiki Kaisha, Nagoya, Japan

Filed Jun. 14, 1976, Ser. No. 695,925
Claims priority, application Japan, Jun. 19, 1975, 50-73754
Int. Cl.[2] H01F *1/00;* A61K *29/02, 33/26*
U.S. Cl. 252—62.53 14 Claims

1. A water dispersable magnetic iron oxide-dextran complex wherein the proportion of the dextran, calculated as its anhydrous glucose unit, is about 0.1 to about 1 mole per mole of iron oxide, calculated as an iron atom.

4,101,436

CONSTANT BOILING MIXTURES OF 1-CHLORO-2,2,2-TRIFLUOROETHANE AND HYDROCARBONS

Kevin P. Murphy, Orchard Park; Richard F. Stahl, Hamburg, and Sabatino R. Orfeo, Orchard Park, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 21, 1976, Ser. No. 753,054
Int. Cl.[2] C09K *5/04*
U.S. Cl. 252—67 12 Claims

1. Constant boiling mixtures consisting essentially of 1-chloro-2,2,2-trifluoroethane and a hydrocarbon selected from the group consisting of isopentane, n-pentane, n-butane, 2,2-dimethylpropane and isobutane.

7. The process of producing refrigeration which comprises condensing a constant boiling mixture as described in claim 1 and thereafter evaporating said mixture in the vicinity of a body to be cooled.

4,101,437

INHIBITOR FOR AQUEOUS ACID SOLUTIONS

Josef Rones, and Joachim Geldner, both of Detusch, Fed. Rep. of Germany, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 29, 1977, Ser. No. 782,582
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616144
Int. Cl.[2] C11D *7/32, 7/60*
U.S. Cl. 252—149 6 Claims

1. An inhibitor for an aqueous acid solution consisting essentially of the condensation product of a mixture of diethyl- and dibutyl-thiourea with hexamethylenetetramine wherein the weight ratio of diethyl- to dibutyl-thiourea is from 1:5 to 5:1 and wherein the mole ratio of hexamethylenetetramine to thiourea mixture is from 0.1 to 1.1.

5. An inhibited aqueous acidic solution comprising the product of claim 1 and at least one acid selected from the group consisting of hydrofluoric, hydrochloric, sulphuric, amidosulphonic, citric, tartaric and oxalic acids.

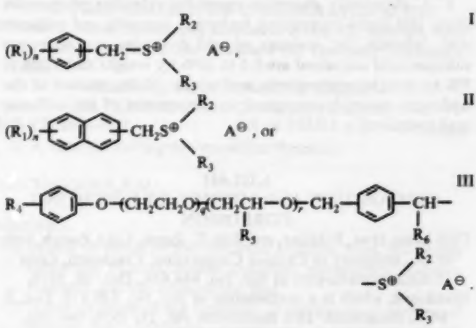
4,101,438

SULFONIUM COMPOUNDS AS CORROSION INHIBITORS IN AQUEOUS ACIDIC CLEANING SOLUTIONS

Wayne W. Frenier, and William J. Settineri, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 350,295, Apr. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 118,175, Feb. 23, 1971, Pat. No. 3,764,543. This application Mar. 22, 1976, Ser. No. 669,116
The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.
Int. Cl.[2] C11D *7/34;* C23G *1/06*
U.S. Cl. 252—151 20 Claims

1. An aqueous acidic cleaning solution of at least one organic acid having dissolved or dispersed therein a sulfonium salt corresponding to the formula



wherein n is 1 or 2; each R_1 independently is hydrogen or a hydrocarbyl, a hydrocarbyl whose chain length is interrupted by an atom of oxygen or sulfur, a hydrocarbyloxy or a hydrocarbylthio radical of from 1 to about 24 carbon atoms; R_2 is a hydrocarbyl or inertly-substituted hydrocarbyl radical of from 1 to about 24 carbon atoms, with the proviso that the total aggregate carbon content of R_1 and R_2 is from 7 to about 25; R_3 is an alkyl radical of from 1 to 4 carbon atoms or an inertly-substituted alkyl radical of from 2 to 4 carbon atoms, allyl, phenyl or an inertly-substituted phenyl radical; or R_2 and R_3 are joined to form a 5- or 6-membered heterocyclic ring, with the proviso that the total aggregate carbon content of R_1, R_2

and R_3 is from 10 to about 25; R_4 is alkyl of 4 to about 20 carbon atoms; R_5 is methyl or ethyl; R_6 is hydrogen, methyl or ethyl; q is an integer of from 0 to 8; r is an integer of from 0 to 10, with the proviso that the sum of q plus r is equal to or less than 10; and $A^{\ominus}$ is an anion; said sulfonium salt being present in an amount at least sufficient to inhibit the acid-induced corrosion of ferrous metals in contact with said solution and ferric ions.

4,101,439

POLYOL BLENDS AND POLYURETHANE PREPARED THEREFROM

David D. Russell, Atwater, and George Shkapenko, Akron, both of Ohio, assignors to Samuel Moore & Company, Mantua, Ohio

Division of Ser. No. 617,655, Sep. 29, 1975, Pat. No. 4,010,146. This application Jul. 6, 1976, Ser. No. 702,936

Int. Cl.[2] C08G *18/32*

U.S. Cl. 252—182 **1 Claim**

1. A blend of a block copolymer of ethyleneoxide and 1,2-propylene oxide having the formula

$$HO[(C_2H_5—O)_x(C_3H_6—O)_y(C_2H_5—O)_z]H$$

wherein x and z are integers of from 0 to 22 and y is an integer of from 1 to 20 and the molecular weight of the copolymer is between 500 and 3000 and poly(tetramethylene ether)glycol having a molecular weight of from about 500 to about 3000, in a ratio of from about 5 to about 95 parts by weight of the copolymer per 100 parts of poly(tetramethylene ether)glycol, said block copolymer containing from about 60 to about 100 percent primary hydroxyl groups.

4,101,440

CHEMICALLY DIGESTIVE AGENTS

Motoo Akagi; Hazime Morishita; Saburo Nonogaki, all of Tokyo; Makoto Tanaka, Koganei, and Tadao Kaneko, Tokyo all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 15, 1976, Ser. No. 705,529

Claims priority, application Japan, Jul. 23, 1975, 50-89248; Nov. 25, 1975, 50-140215

Int. Cl.[2] C01B *15/02;* H04N *9/60*

U.S. Cl. 252—186 **19 Claims**

1. A chemically digestive agent for releasing photoresist films, said agent comprising hydrogen peroxide and sulfamic acid, wherein the amounts of said hydrogen peroxide and sulfamic acid contained are 0.5 to 10% by weight and 0.001 to 5% by weight, respectively, and a ratio of the amount of the hydrogen peroxide contained to the amount of the sulfamic acid contained is 1:0.001 to 1:2.

4,101,441

COMPOSITION AND METHOD OF INHIBITING CORROSION

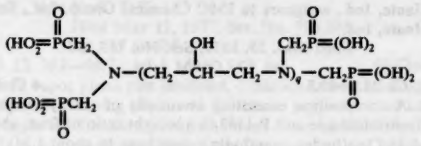
Chih Ming Hwa, Palatine, and Jose T. Jacob, Lake Zurich, both of Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 644,654, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 529,175, Dec. 3, 1974, abandoned. This application Jul. 21, 1976, Ser. No. 707,717

Int. Cl.[2] C23F *11/16, 11/14, 11/18*

U.S. Cl. 252—389 A **4 Claims**

1. A non-chromate-containing corrosion inhibiting composition which consists essentially of 1 to 80 weight percent azole, 0.1 to 98 weight percent water-soluble phosphate and 1 to 85 weight percent of water-soluble organophosphonic acid, water-soluble salts and esters thereof, said azole being a member of the group consisting of triazoles, pyrazoles, imidazoles, isoxazoles, oxazoles, isothiazoles, thiazoles, and mixtures thereof, said water soluble phosphate being selected from the group consisting of phosphoric acid, disodium phosphate, dipotassium phosphate, sodium tripolyphosphate, tetrapotassium pyrophosphate and tetrasodium pyrophosphate, and said organophosphonic acid having the formula



in which $q = 1 - 10$.

4,101,442

NON-AQUEOUS ANTIFOAM COMPOSITIONS

Meyer Robert Rosen, Spring Valley, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,393

Int. Cl.[2] B01D *17/00*

U.S. Cl. 252—358 **10 Claims**

1. A non-aqueous antifoam composition consisting essentially of a lipophilic nonionic surface active agent having a hydrophilic-lipophilic balance value of less than 9 homogeneously dispersed in a transient siloxanate antifoam agent, wherein said siloxanate antifoam agent consists essentially of the product resulting from heating, in the absence of water, a mixture consisting essentially of a finely divided silica filler and a condensation product of a partially hydrolyzed trifunctional silane, said condensation product having a residual alkoxy content of at least about 9 percent by weight, said silane being selected from the group consisting of $RSiX_3$ and $RSi(OR')_3$ wherein R is an alkyl radical having 1 to 5 carbon atoms, R' is an alkyl radical having 1 to 4 carbon atoms and X is a halogen atom, wherein the amount ratio of said silica filler to said condensation product ranges from about 1 to about 33 parts by weight of the silica filler per 100 parts by weight of the condensation product, and wherein the amount ratio of said surface active agent to said antifoam agent ranges from about 3 to about 33 parts by weight of the surface active agent per 100 parts by weight of the antifoam agent.

4,101,443

TRANSIENT ANTIFOAM COMPOSITIONS

Meyer Robert Rosen, Spring Valley, and Samuel Sterman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,394

Int. Cl.[2] B01D *17/00*

U.S. Cl. 252—358 **8 Claims**

1. A transient non-aqueous antifoam composition, said composition consisting essentially of the product resulting from heating, in the absence of water, a mixture consisting essentially of a finely divided silica filler and a condensation product of a partially hydrolyzed trifunctional silane, said condensation product having a residual alkoxy content of at least about 9 percent by weight, said silane being selected from the group consisting of $RSiX_3$ and $RSi(OR')_3$ wherein R is an alkyl radical having 1 to 5 carbon atoms, R' is an alkyl radical having 1 to 4 carbon atoms and X is a halogen atom, and wherein the amount ratio of said silica filler to said condensation product ranges from about 1 to about 33 parts by weight of the silica filler per 100 parts by weight of the condensation product.

4,101,444
CATALYST DEMETALLIZATION UTILIZING A COMBINATION OF REDUCTIVE AND OXIDATIVE WASHES

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jun. 14, 1976, Ser. No. 695,662
Int. Cl.[2] B01J *29/38, 8/24;* **C10G** *11/18*
U.S. Cl. 252—411 R **16 Claims**

1. In a process for treating a metal contaminated catalyst which has been poisoned in a hydrocarbon conversion process by a feedstock containing metal poisons to remove at least a portion of the metal contaminants and to produce a catalyst with improved catalytic activity, the improvement which comprises:

(i) removing at least a portion of the metal poison from said catalyst by (a) contacting said catalyst with a liquid reductive wash medium; and (b) subsequently contacting the reductively washed catalyst with a liquid oxidative wash medium; and

(ii) recovering a catalyst of reduced metal poison content and improved catalytic activity.

4,101,445
PREPARATION OF MODIFIED AND ACTIVATED CHROMOCENE CATALYSTS FOR ETHYLENE POLYMERIZATION

Isaac Jacob Levine, Somerville, and Frederick John Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

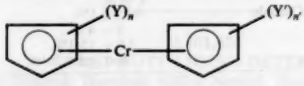
Filed Sep. 22, 1976, Ser. No. 725,542
Int. Cl.[2] C08F *4/76, 4/78*
U.S. Cl. 252—429 R **9 Claims**

1. A method for preparing a catalyst for the consistent polymerization of ethylene which comprises the steps of:

(1) drying an inorganic oxide catalyst support, having a high surface area, selected from the group consisting of a alumina, thoria, silica, zirconia, and mixtures thereof at a temperature of about 100° C. to about 800° C.;

(2) slurrying the dried support obtained in step (1) with a substantially anhydrous normally liquid hydrocarbon;

(3) blending the slurry obtained in step (2) with a solution of a chromocene compound having the formula:



wherein each of Y and Y' is a hydrocarbon radical having 1 to about 20 carbon atoms and each n and n' has a value of 0 to 5, in a normally liquid hydrocarbon and a titanium compound which is soluble in said hydrocarbon and is calcinable to TiO_2 whereby the resultant blend, exclusive of hydrocarbon, contains about 0.02 to about 3.0 weight % of elemental chromium and about 1.0 to about 10 weight % of elemental titanium;

(4) removing the hydrocarbon leaving a solid residue;

(5) adding to the residue from step (4) from 0 to about 2.5 weight % of a fluoridation agent calculated as F; and

(6) heating the product from step (5) in a substantially anhydrous oxygen-containing atmosphere at a temperature of about 300° C. to about 1000° C. until an active ethylene polymerization catalyst is obtained.

4,101,446
LEAD ACETATE IMPREGNATED MAGNESIUM SILICATE FOR THE PRODUCTION OF PERCHLOROMETHYL MERCAPTAN

Milton L. Honig, Bronx, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,120
Int. Cl.[2] B01J *21/14, 31/04;* **C07C** *145/00*
U.S. Cl. 252—430 **6 Claims**

1. A catalyst composition suitable for the production of perchloromethyl mercaptan consisting essentially of lead acetate, impregnated magnesium silicate, wherein the ratio of lead acetate to magnesium silicate varies from about 3:1 to about 1:3.

3. A method for preparing a catalyst suitable for the production of perchloromethyl mercaptan which comprises contacting lead acetate with a solvent selected from the group consisting of methanol, ethanol, glycerol, ethylene glycol, and water, to form a solution; contacting said solution with magnesium silicate and removing said solvent to produce a dry, powdery product, whereby the ratio of lead acetate to magnesium silicate of said dry, powdery product varies from about 3:1 to about 1:3.

4,101,447
PYRROLIDONE POLYMERIZATION CATALYST SYSTEM

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 20, 1976, Ser. No. 724,801
Int. Cl.[2] B01J *31/12;* **C08G** *73/16*
U.S. Cl. 252—431 C **8 Claims**

1. A process for making catalysts for the polymerization of 2-pyrrolidone which comprises contacting an alkali metal pyrrolidonate, a tetraalkyl ammonium alkanoate and carbon dioxide in mol ratios of about 1:1.1-2:0.1-0.5.

4,101,448
CATALYST COMPOSITIONS ESPECIALLY USEFUL FOR PREPARATION OF UNSATURATED ACIDS

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 14, 1976, Ser. No. 686,352
Int. Cl.[2] B01J *27/14, 23/10, 23/14, 23/16*
U.S. Cl. 252—437 **8 Claims**

1. A catalyst having the empirical formula:

$$Mo_aV_bGe_cX_dY_eO_f$$

wherein

X is one or more of the elements selected from the group consisting of iron, nickel, thallium, phosphorus, indium, bismuth, and the rare earths; and

Y is one or more of the elements of the group consisting of copper, tin, chromium, manganese, magnesium, aluminum, titanium, arsenic, niobium, tantalum, potassium, rubidium, cesium, tungsten, uranium, cobalt, silver, gallium, antimony, and zinc; and

wherein the number of atoms of each element present is represented by *a* through *f*,

wherein

a is a number from 6 to 18;

b is a number from 0.1 to 10;

c is a number from 0.1 to 6;

d is a number from 0.01 to 5;

e is a number from 0 to 5;

f is a number that satisfies the valence requirements of the other elements present.

4,101,449

CATALYST AND ITS METHOD OF PREPARATION

Mikio Noda, Nagoya; Yoshinobu Yamaguchi, Seto; Ken-ichiro Uwano, Kariya; Nobuhiro Sato, Nagoya; Tadayoshi Tomita, and Koji Otsuka, both of Yokohama, all of Japan, assignors to Fujimi Kenmazai Kogyo Co., Ltd., Aichi and Toyo Engineering Corporation, Tokyo, both of, Japan

Filed May 9, 1977, Ser. No. 795,417

Claims priority, application Japan, Jul. 20, 1976, 51-86272

Int. Cl.[2] B01J *21/04, 21/08, 23/78*

U.S. Cl. 252—457 9 Claims

1. The method of preparing a sintered shaped catalyst object which comprises the steps of:

forming a moldable mixture by mixing and kneading with water

(a) fine particles of essentially pure nickel oxide having a maximum particle size of less than about 10 microns,

(b) particles of calcium oxide or particles of a calcium compound or a mixture of calcium compounds which compounds can be converted to pure calcium oxide free of impurities by heating same at the below-mentioned sintering temperature, and

(c) an alumina hydraulic cement consisting essentially of calcium aluminates, the amount of said cement (c) being at least 8 weight percent based on the sum of the weights of ingredients (a), (b) and (c), wherein the ingredients (a), (b) and (c) are present in amounts effective to provide a sintered shaped catalyst object having the composition set forth hereinbelow;

molding the moldable mixture into a shaped object;

hardening the shaped object, at a temperature of from 5° to 35° C, in an ambient atmosphere having a relative humidity of higher than 60%, for longer than one day to hydrate and harden the cement;

drying the shaped object at a temperature below 350° C; and

sintering the dried shaped object at a temperature in the range of from 550° to 1200° C, the thus sintered catalyst object consisting essentially of 10 to 30 weight percent of nickel oxide, 20 to 60 weight percent of calcium oxide and 10 to 70 weight percent of aluminum oxide and containing less than 1 weight percent of silicon dioxide.

4,101,450

CATALYST FOR PRODUCTION OF ACETIC ACID

H. Shinn Hwang, Livingston, and Paul D. Taylor, Clinton, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,260

Int. Cl.[2] B01J *29/12, 29/22, 23/40*

U.S. Cl. 252—460 5 Claims

1. A method for the preparation and pretreatment of a catalyst composition which is highly selective for the production of oxygenated C_2-hydrocarbon derivatives from synthesis gas which comprises (1) co-impregnating a carrier substrate with an aqueous solution of soluble rhodium and ruthenium compounds, and subjecting the co-impregnated carrier substrate to drying conditions to remove substantially all of the water content, wherein the resultant catalyst composition consists essentially of between about 0.1 and 10 weight percent rhodium metal and between about 0.01 and 2 weight percent ruthenium metal, based on the total catalyst composition weight; (2) calcining and reducing the catalyst composition by contacting said catalyst composition with hydrogen at a temperature between about 200° C and 500° C; and (3) subsequently heating the catalyst composition in a static atmosphere of carbon monoxide and hydrogen at a temperature between about 150° C and 350° C for a time period between about 0.2 and 20 hours.

4,101,451

ENHANCEMENT OF PROMOTED COPPER CATALYST

Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 19, 1977, Ser. No. 760,775

Int. Cl.[2] B01J *21/04, 23/72, 23/56, 23/74*

U.S. Cl. 252—465 6 Claims

1. A process for improving an active catalyst consisting essentially of a mixture of finely divided copper metal and a minor proportion of at least one activator metal of the group consisting of silver, platinum, palladium, manganese, cobalt, nickel, chromium, and molybdenum supported on gamma-alumina having a surface area of at least about 10 sq meters per gram, which process consists essentially of impregnating said catalyst with about 0.01–0.3 gram mole of alkali metal hydroxide solution per 100 grams of catalyst, roasting the impregnated catalyst at a temperature up to about 650° C sufficient to cause a reaction between the alkali metal hydroxide and the alumina surface, and contacting the roasted alkali-impregnated catalyst with hydrogen at about 100° C–400° C for a time sufficient to convert essentially all copper and activator metal present to the metallic state.

4,101,452

LEAD SULFIDE ACTIVATION PROCESS

Ronald G. Newburgh, Brookline, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Continuation-in-part of Ser. No. 311,949, Sep. 27, 1952, which is a continuation-in-part of Ser. No. 223,435, Apr. 27, 1951. This application Oct. 25, 1954, Ser. No. 464,603

Int. Cl.[2] H01B *1/00*

U.S. Cl. 252—501 16 Claims

1. The process of photosensitizing lead sulfide comprising adding a persulfate solution to intermixed solutions of thiourea, lead acetate and sodium hydroxide whereby activated lead sulfide is precipitated therefrom.

4,101,453

SINTERED COMPOSITION

Raymond Leslie Orford, Solihull, and Dexter William Smith, Hall Green, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 14, 1977, Ser. No. 777,535

Claims priority, application United Kingdom, Mar. 20, 1976, 11317/76; Aug. 18, 1976, 34373/76

Int. Cl.[2] H01B *1/02, 1/04*

U.S. Cl. 252—503 10 Claims

1. A brush for a dynamo electric machine comprising a sintered composition substantially composed of the following ingredients by weight:

Carbon	1 –8%
Silicon Carbide	0.85–5.1%
Tin	0 – 4%
Lead	7.5 – 15.3%,
Copper	and remainder

4,101,454

CERAMIC SEMICONDUCTORS

Bernard M. Kulwicki, Foxboro, and Norman P. St.Martin, Taunton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 536,502

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—514 1 Claim

1. A ceramic semiconductor material of positive temperature co-efficient of resistivity adapted to display a sharp increase in resistivity when heated to a selected temperature comprising a base ceramic composition selected from the group consisting of titanates, stannates, and zirconates of barium, strontium,

calcium, and lead having a selected addition thereto of silicon in the range from 2.0 to 4.0 mol percent, a dopant selected from the group consisting of yttrium, niobium, and rare earths heavier than dysprosium, characterized in that the material further includes ruthenium in the range of 0.001 to 0.020 mol percent as an activator to reduce the voltage sensitivity of the material at said selected temperature.

4,101,455

LOW PHOSPHATE CONTENT GLASSY PHOSPHATE DETERGENT COMPOSITIONS HAVING OPTIMUM DETERGENCY

Edward Francis, Midland, Mich.; Craig Ronald Carson, and Michael Lance McKay, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 587,451, Jun. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 551,476, Feb. 20, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,320

Int. Cl.[2] C11D *3/06, 3/065*

U.S. Cl. 252—531 **3 Claims**

1. A granular detergent composition consisting essentially of:

(A) from about 0.5% to about 2.5% of a glassy phosphate having the general formula

$$M_{y+2}P_{y}O_{6y+1}$$

wherein M is an alkali metal and y has a value in the range of from about 7 to about 12;

(B) from about 22 to about 28% by weight of the composition of an alkali metal of a phosphate builder mixture comprising:

(i) from about 10 to 15% by weight of the composition of a pyrophosphate-orthophosphate mixture wherein the ratio of pyrophosphate to orthophosphate is in the range of 10:1 to 3:1 by weight, the cations of said salts being selected from the group consisting of hydrogen, alkali metal, ammonium and substituted ammonium cations with at least one of the cations being something other than hydrogen; and

(ii) from about 7 to about 18% by weight of the composition of a tripolyphosphate;

(C) from about 15 to about 25% by weight of the composition of an organic surfactant selected from the group consisting of water-soluble C_{10}–C_{20} alkyl ether sulfates containing an average of from 1 to 4 ethylene oxide groups, water-soluble C_{12}–C_{20} linear alkyl sulfates, and water-soluble C_{10}–C_{14} linear alkyl benzene sulfonates and mixtures thereof;

(D) from about 1 to about 15% of sodium silicate having an SiO_2:Na_2O ratio of from about 4:1 to about 1.5:1; and

(E) from about 5 to about 40% sodium sulfate.

4,101,456

LIGHT DUTY LIQUID DETERGENT

Jean Renaud, Bougival; Gilles Noiriel, Rueil-Malmaison, and Georges Chazard, Bezons, all of France, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 674,788

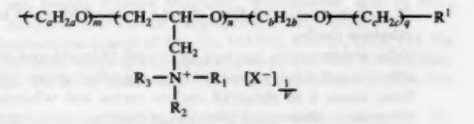
Claims priority, application United Kingdom, Apr. 18, 1975, 16108/75

Int. Cl.[2] C11D *1/37, 1/62, 3/26*

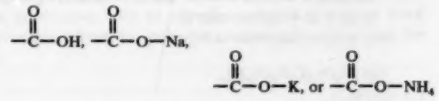
U.S. Cl. 252—551 **12 Claims**

7. A liquid detergent composition adapted for washing articles having soiled glazed surfaces which are thereafter dried by draining which consists essentially of 15% to 45% by weight of a water-soluble surface active agent mixture of an anionic sulfonated detergent salt selected from the group consisting of C_{10}–C_{16} alkyl benzene sulfonate, C_{12}–C_{18} α olefin sulfonate and C_{10}–C_{20} alkyl sulfonate and a second detergent which is a C_{12}–C_{15} alkyl polyethenoxy ether sulfate containing 1 to 5 ethylene oxide groups, the weight ratio of sulfonate detergent to said second detergent being in the range of 1:4 to 4:1; about 0.05% to 5% by weight of a water-soluble non-proteinaceous, cationic polymer having the following structural formula

wherein R_{Cell} is the residue of an anhydroglucose unit, y is an integer having a value of from 50 to 20,000 and each R individually represents a substituent group of the general formula:



wherein a is 2 or 3; b is 2 or 3; c is 1, 2 or 3; m is 0 or an integer from 1 to 10; n is 0, 1, 2 or 3; p is 0 or an integer from 1 to 10; q is 0 or 1;
R' is -H,



with the proviso that when q is 0 or R' is -H;

R_1, R_2 and R_3 taken individually represent alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxyalkyl or alkoxyaryl radicals containing up to 10 carbon atoms, with the proviso that when any one of them is an alkoxyalkyl radical there are at least 2 carbon atoms separating the oxygen atom from the nitrogen atom, with the further proviso that the total number of carbon atoms is R_1, R_2 and R_3 is from 3 to 12 and with the further proviso that when R_1, R_2, and R_3 are taken together, the nitrogen atom to which R_1, R_2 and R_3 are attached can be a component of a hetercyclic ring selected from pyridine, α-methylpyridine, 2,5-dimethylpyridine, 2,4,6-trimethylpyridine, N-methylpiperidine, N-ethylpiperidine, N-methylmorpholine and N-ethylmorpholine;

X is an anion;

V is an integer which is equal to the valence of X; the average value of n per anhydroglucose unit of said cellulose ether is from 0.01 to 1; **and the average of** $m+p+q$ per anhydroglucose unit of said cellulose ether is from 0.01 to 4, the weight ratio of said surface-active agent mixture to polymer being from about 2:1 to about 1000:1; and an aqueous medium containing from 0% to 12% by weight of a C_2–C_3 alkanol.

4,101,457

ENZYME-CONTAINING AUTOMATIC DISHWASHING COMPOSITION

Geoffrey Place, and Edward John Maguire, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 635,830, Nov. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 479,952, Jun. 17, 1975, abandoned. This application Jun. 24, 1976, Ser. No. 699,415

Int. Cl.[2] C11D *1/12*

U.S. Cl. 252—559 **9 Claims**

1. A cleaning composition, particularly suitable for use in

automatic dishwashers and having improved anti-redeposition properties, consisting essentially of:

(a) from about 0.5 to about 20% by weight of an alkoxylated nonionic surface-active agent selected from the group consisting of:

(i) the condensation product of one mole of a carboxylic acid having from about 10 to about 18 carbon atoms with from about 5 to about 50 moles of ethylene oxide;

(ii) the condensation point of an alcohol having from about 10 to about 24 carbon atoms with from about 5 to about 50 moles of ethylene oxide;

(iii) polyethylene glycol having a molecular weight of from about 1400 to about 30,000;

(iv) the condensation product of one mole of alkyl phenol wherein the alkyl chain contains from about 8 to about 18 carbon atoms with from about 4 to about 50 moles of ethylene oxide;

(v) the condensation product of benzyl chloride and an ethoxylated alkyl phenol wherein the alkyl group has from about 6 to about 12 carbon atoms and wherein from about 12 to about 20 moles of ethylene oxide have been condensed per mole of alkyl phenol;

(vi) polyetheresters of the formula

$$(ClC_6H_4)_2CHCO_2(CH_2.CH_2.O)_xR$$

wherein x is from 4 to 20 and R is an alkyl group with from 1 to 4 carbon atoms;

(vii) polyoxyalkylene compounds of the formula

$$Y[(C_3H_6O)_n(C_2H_4O)_mH]_x$$

wherein Y is an organic radical having from 1 to about 18 carbon atoms and containing x reactive hydrogen atoms and the values of n and m are such that the (C_2H_4O) content is from about 10 to about 90% by weight;

(viii) the alkoxylated nonionic surface-active agents having the formula of (i) through (vii) in which the terminal hydroxyl of the alkoxy group is acylated with a monobasic acid; and

(ix) mixtures thereof;

(b) from about 0.001 to about 5% by weight of a proteolytic enzyme which exhibits a proteolytic activity of 80 to 100% of maximum activity when measured at pH 12 by the Anson hemoglobin method carried out in the presence of urea, said enzyme being present in an amount such that the detergent composition has a proteolytic activity of at least 6.0 Anson units/kg.;

(c) from 0 to about 60% by weight of detergent builder ingredients selected from the group consisting of the alkali metal salts of polyphosphates, carbonates bicarbonates, silicates, polyacetates, carboxylates, polycarboxylates, polyhydroxy sulfonates and mixtures thereof;

(d) from 0 to about 20% water;

(e) from 0 to about 75% of china protecting agents selected from the group consisting of silicates, water-soluble aluminosilicates, aluminates and mixtures thereof;

(f) from 0 to about 75% of fillers selected from the group consisting of sodium sulfate, sucrose, sucrose esters and mixtures thereof;

(g) from 0 to about 20% by weight of a sulfonated aromatic compatibilizing agent having a critical micelle concentration greater than 1% by weight at 25° C, wherein the weight ratio of said alkoxylated nonionic surface-active agent to said sulfonated compatibilizing agent is in the range from about 2:5 to about 5:3;

which is substantially free of bleach and brightener components.

4,101,458

ELECTROLYTE FOR ELECTROLYTIC CAPACITORS

Yutaka Taketani, and Shinichi Niwa, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 554,011, Feb. 28, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,975

Claims priority, application Japan, Nov. 16, 1973, 48-129869; Fed. Rep. of Germany, Feb. 28, 1975, 2508904

Int. Cl.[2] H01G 9/02

U.S. Cl. 252—62.2 **4 Claims**

1. An electrolyte for electrolytic capacitors consisting essentially of a solvent, a solute dissolved therein, and an amount of water sufficient to form a dielectric layer on a capacitor anode, wherein said solvent consists essentially of an amide solvent containing at least 10% by weight of N-ethylformamide and said solute is an acid salt of maleic acid with ammonia or an amine, the amide solvent other than N-ethylformamide when present being selected from the group consisting of N-methylformamide, dimethylformamide, diethylformamide and dimethylacetamide.

4,101,459

COMPOSITIONS FOR CURING EPOXIDE RESINS

Christopher Michael Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,072

Claims priority, application United Kingdom, Oct. 23, 1975, 43497/75

Int. Cl.[2] C08G 59/56, 59/68

U.S. Cl. 260—18 EP **9 Claims**

1. A composition comprising

(i) an epoxide resin,

(ii) from 0.75 to 1.25 amino hydrogen equivalents of an aromatic, heterocyclic, or cycloaliphatic polyamine per 1,2-epoxide equivalent of the epoxide resin (i), and

(iii) a metal salt of trifluoromethanesulfonic acid, said metal selected from the group consisting of lithium, calcium, zinc, cadmium, cobalt, nickel, manganese, and magnesium.

4,101,460

HIGH PERFORMANCE ION EXCHANGE COMPOSITION

Hamish Small, and Timothy S. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 402,669, Oct. 2, 1973, abandoned. This application Jul. 7, 1975, Ser. No. 593,345

Int. Cl.[2] C08J 5/20

U.S. Cl. 521—28 **25 Claims**

1. A composition of matter for exchanging ions comprising:

Component A, an insoluble substrate which consists essentially of synthetic resin, having ion exchanging sites at least on its available surface; and

Component B, a finely divided, insoluble material comprising synthetic resin particles of from about 0.1 micron to about 5 microns median diameter having, at least on their outer surfaces, ion exchanging sites which attract available sites of Component A; wherein the particles of Component B are irreversibly attached as a monolayer to the available surface of Component A.

4,101,461

METHOD FOR PREPARATION OF ANION EXCHANGERS BY SUBSTITUTION OF HYDROPHILIC POLYMERIC GELS

Petr Strop; Jiri Coupek; Otakar Mikes, and Jiri Hradil, all of Prague, Czechoslovakia, assignors to Czechoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 7, 1975, Ser. No. 548,094

Claims priority, application Czechoslovakia, Feb. 8, 1974, 896-74

Int. Cl.[2] B01D *15/04;* C08J *5/20;* B01D *15/08*

U.S. Cl. 521—32 17 Claims

1. Method for the preparation of hydrophilic anion exchangers from polymeric gels containing hydroxyl groups in their structure wherein a crosslinked copolymer of hydroxyl group containing acrylate, methacrylate, acrylamide and methacrylamide monomers is modified by reaction of said copolymer with an amino compound selected from the group consisting of halogenoalkylamines, halogenoalkylamonium compounds, epoxyalkylamines and epoxyalkylammonium compounds, said reaction being effected after activation of said copolymer by treatment thereof under basic conditions.

4,101,462

URETHANE CATALYST

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

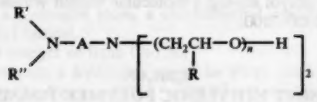
Filed Apr. 7, 1977, Ser. No. 785,388

Int. Cl.[2] C08G *18/18, 18/20*

U.S. Cl. 521—115 7 Claims

4. A method for producing a polyurethane foam which comprises:

reacting, in the presence of a blowing agent, an organic polyisocyanate with an organic polyhydroxyl compound in the presence of a catalytic amount of an amine catalyst of the formula:



where R is independently hydrogen or a methyl radical provided the terminal hydroxyl group is secondary; R′ and R″ are, independently, lower alkyl radicals or, taken together with the nitrogen atom to which they are attached form a morpholine ring; A is a straight or branched chain alkylene radical having two to four carbon atoms; and *n* has an average value of from one to about three;

said organic polyhydroxyl compound being either a polyhydric polyether or a polyester having terminal hydroxyl groups, which polyesters are obtained from the reaction of a polycarboxylic acid with a polyhydric alcohol.

4,101,463

MOLDED COMPOSITION AND ARTICLE MOLDED THEREFROM

Donald F. Morgan, Bloomingdale, and Irwin S. Wolosky, Parsippany, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 546,875, Feb. 4, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,471

Int. Cl.[2] C08J *11/04;* B29H *19/00*

U.S. Cl. 260—2.3 25 Claims

1. A vulcanizing molding composition processable into a solid rubber tire, said composition consisting essentially of:

a. a previously vulcanized non-devulcanized hydrocarbon rubber polymer in an amount ranging from about 94% to about 99% by weight of the total composition;

b. a vulcanizing agent in an amount ranging from about 1 to about 4% by weight of the total composition; and

c. an accelerator comprising a mixture of at least two compounds present in an amount of from about 0.13% to about 2% by weight of the total composition, said at least two compounds being selected from the group consisting of quanidines, thiazoles, dithiocarbamates and thiurams.

4,101,464

PROCESS FOR PREPARING FOAMED SOLIDS USING TWO OR MORE AZO COMPOUNDS

Ernest Rudolph Kamens, Tonawanda, N.Y.; Donald Milton Kressin, Glen Burnie, Md.; Harold Carl Lange, Grand Island, and Ronald Edward MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Phialdelphia, Pa.

Continuation-in-part of Ser. No. 548,946, Feb. 11, 1975, Pat. No. 3,993,609, which is a continuation-in-part of Ser. No. 453,446, Mar. 21, 1974, abandoned. This application Sep. 16, 1976, Ser. No. 723,679

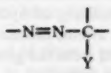
The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] C08J *9/02*

U.S. Cl. 521—88 23 Claims

1. A process for preparing cellular polymeric structures which comprises mixing an acidulous or acidic polymerizable medium that is polymerizable and/or cross-linkable by a free radical mechanism with an effective amount of two or more acid sensitive mono- or poly-azo compounds containing the group:

FORMULA I



wherein in Y is an acid sensitive group which in the presence of an acidulous or acidic polymerizable medium causes sufficient decompositon of the azo compound that gas is released in said medium and during said decomposition said mono- or poly-azo compound promotes polymerization and/or corss-linking of said medium to provide a matrix that is sufficiently polymerized and/or cross-linked that the generated gases cause the matrix to expand, each of the remaining valences being satisfied by an organic radical; provided that any carbon atom that is directly linked to an azo nitrogen, except that of a carbonyl group, has at least two of its remaining three valences satisfied by a carbon to carbon bond or a carbon to hydrogen bond.

4,101,465

A COCATALYST SYSTEM FOR TRIMERIZING ISOCYANATES

Robert J. Lockwood, East Haven; Alexander McLaughlin, Meriden, and Harold E. Reymore, Jr., Wallingford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

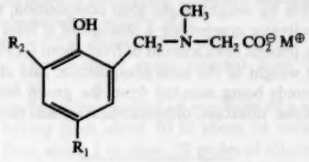
Filed Oct. 6, 1976, Ser. No. 729,899

Int. Cl.[2] C08G *18/14*

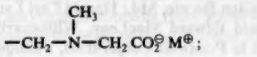
U.S. Cl. 521—118 26 Claims

1. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is isocyanurate which process comprises bringing together in the presence of a blowing agent, an organic polyisocyanate, a trimerization catalyst, and a minor amount of a polyol, the improvement which comprises employing as the catalyst, a combination consisting essentially of:

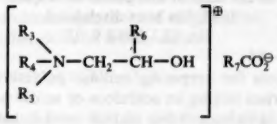
(a) a glycine salt having the formula



wherein M is an alkali metal, R_1 is selected from the class consisting of hydrogen and alkyl having from 1 to 12 carbon atoms, and R_2 is selected from the class consisting of hydrogen and the group



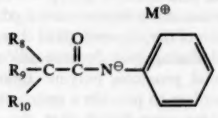
(b) a hydroxyalkyltrialkylammonium carboxylate salt having the formula



wherein R_3, R_4, R_5 can be the same or different and represent alkyl having from 1 to 4 carbon atoms, inclusive, R_6 is selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms, inclusive, and R_7 is selected from the class consisting of hydrogen and alkyl having from 1 to 8 carbon atoms, inclusive; and

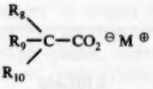
(c) an alkali metal salt selected from the group consisting of

(i) an amide salt having the formula



wherein M is as defined hereinbefore, R_8, R_9, and R_{10} can be the same or different and are selected from the group consisting of hydrogen and alkyl from 1 to 4 carbon atoms, inclusive; and

(ii) a carboxylic acid salt having the formula



wherein R_8, R_9, R_{10} and M are as defined hereinbefore.

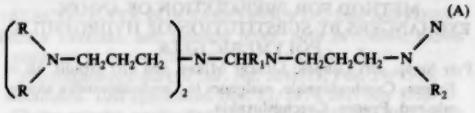
4,101,466

BIS (DIMETHYLAMINOPROPYL)-AMINE DERIVATIVES AS POLYURETHANE CATALYSTS

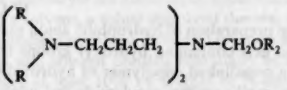
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,577
Int. Cl.[2] C08G *18/18*
U.S. Cl. 521—115 **8 Claims**

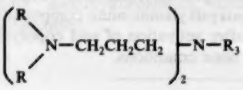
1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having a structure selected from the group consisting of



where R is lower alkyl and R_1 is hydrogen, alkyl phenyl or substituted phenyl and



where R is lower alkyl and R_2 is hydrogen or alkyl; and



where R and R_3 are lower alkyl.

2. The method of claim 1 wherein said organic polyisocyanate has a functionality of from 2 to 4, and said organic polyester or polyether polyol has a hydroxyl number of from about 25 to 700.

6. The method of claim 2 wherein a flexible polyether polyurethane foam is provided which comprises reacting in the presence of a blowing agent said organic polyisocyanate with a polyether polyol formed by the addition of a polyhydric alcohol having a functionality of from 2 to about 4 with an alkylene oxide of 2 to 4 carbon atoms in the presence of said catalyst, said organic polyisocyanate being employed in an amount sufficient to provide 0.4 to 1.5 mol equivalents of isocyanato groups per mol equivalent of hydroxyl groups, said polyether polyol having a molecular weight within the range of about 2000–7000.

4,101,467

SOFT ETHYLENIC POLYMER FOAMS

Chung Poo Park, Pickerington, Ohio; Warren H. Griffin, and John M. Corbett, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 661,911, Feb. 27, 1976, abandoned. This application Jan. 27, 1977, Ser. No. 763,374
Int. Cl.[2] C08J *9/14*
U.S. Cl. 521—79 **21 Claims**

1. A method for making soft ethylenic polymer resin foams having substantially closed cell structure, dimensional stability, and thickness greater than about 0.5 inch from starting ethylenic polymer resins which have low stiffness less than about 20,000 psi and which comprise low stiffness copolymers of ethylene which copolymers consist essentially of ethylene and monoethylenically unsaturated non-ionic comonomers, by forming under heat and pressure a flowable gel composition of the starting polymer resin and a volatile blowing agent and releasing the resulting flowable gel to ambient air atmosphere whereby the blowing agent separates from the gel and forms gas bubbles in the polymer resin, particularly characterized in that the volatile blowing agent is composed of a mixture of an essential constituent I which is at least one fluorocarbon which has normal boiling point between −25° and 20° C, from 2 to 4 carbon atoms in its molecular structure, and a value for the critical quantity $T_b - 0.5V_c$ of not less than 125 where T_b is the normal boiling point temperature of the fluorocarbon in degrees Kelvin and V_c is its critical volume in cubic centimeters per gram-mole, and an essential constituent II which is at least one fluorocarbon which has normal boiling point between −40° and 5° C and a value for its critical quantity $T_b - 0.5V_c$ as

above defined of not greater than 110, the mixed blowing agent containing, per 100 parts by weight, from about 10 to about 50 parts of fluorocarbon constituent II and at least about 75 parts of total fluorocarbon constituents I and II, and there being up to about 0.18 gram-mole of such mixed blowing agent per 100 grams of polymer resin in the flowable gel.

4,101,468
PROCESS FOR COLD-HARDENING POLYURETHANE FOAMS USING SULFONAMIDE EMULSIFIERS

Hermann Perrey, Krefeld; Hans-Joachim Meiners, Leverkusen, both of Fed. Rep. of Germany, and Jürgen Ick, Coraopolis, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

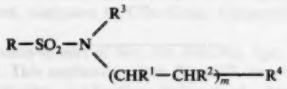
Filed Feb. 10, 1977, Ser. No. 767,608

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607998

Int. Cl.[2] C08G *18/14;* **C07C** *143/72*

U.S. Cl. 521—115 **7 Claims**

1. In a process for the production of cold-hardening foams containing urethane groups by foaming a mixture of polyethers containing at least two hydroxyl groups and having a molecular weight of from about 750 to 100,000, polyisocyanates, water and/or organic blowing agents, emulsifiers and catalysts the improvement wherein, said emulsifier comprises sulphonamide compounds corresponding to the following general formula:



wherein

R represents an alkyl, chloroalkyl, cycloalkyl radical having from 8 to 30 carbon atoms, or an alkaryl radical having from 10 to 30 carbon atoms,

R^1 and R^2, which may be the same or different, each represent a hydrogen atom, a chloromethyl, methyl, ethyl or phenyl radical,

m is an integer of from 0 to 50,

R^3 represents a hydrogen atom, an alkyl, aralkyl, alkaryl, aryl radical or a $-(CHR^1-CHR^2-O-)_mR^4$-group and

R^4 represents a hydrogen atom, an alkyl, aralkyl, acyl, carbamoyl or cyanoalkyl radical having from 1 to 30 carbon atoms.

4,101,469
FOAMABLE RESINOUS POLYMER COMPOSITIONS CONTAINING ACID MIXTURES

J. Gustav Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 16, 1976, Ser. No. 696,743

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—83 **12 Claims**

1. A foamable polymer composition comprising a resinous polymer selected from the group consisting of thermoplastic and thermosetting resins that melt at a temperature up to about 300° C. and a mixture of polycyclic aromatic polycarboxylic acids carrying nuclear nitro groups that is soluble in acetone but insoluble in water, wherein the average number of benzene rings in the individual acid molecules ranges from two to about ten, the average number of carboxyl groups carried by the individual acid molecules ranges from about four to about ten, the average number of nitro groups carried by the individual acid molecules ranges from about one to about four, the average molecular weight of the acid mixture ranges from about 600 to about 1500 and the average nuclear equivalent of the acid mixture ranges from about 80 to about 200, said acid mixture having been prepared by reacting coal with aqueous nitric acid having a concentration of about five to about 90 percent at a temperature in the range of about 15° to about 200° C. for about 0.5 to about 15 hours at a pressure of about atmospheric to about 1000 pounds per square inch gauge, mechanically separating the solids in the resulting reaction mixture, extracting the resulting solids with a polar solvent and then separating the polar solvent from the extract to recover said acid mixture.

4,101,470
URETHANE CATALYSTS

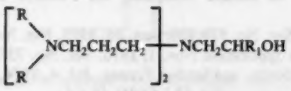
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,991

Int. Cl.[2] C08G *18/18*

U.S. Cl. 521—118 **8 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having the following structural formula:



where R is lower alkyl and R_1 is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, or an aromatic hydrocarbon radical; the R_1 radical can also bear an alkyl, cyano, nitro, or halo substituent.

2. A method of claim 5 wherein said organic polyisocyanate has a functionality of from 2 to 4, and said organic polyester or polyether polyol has a hydroxyl number of from about 25 to 700.

6. The method of claim 2 wherein a flexible polyether polyurethane foam is provided which comprises reacting in the presence of a blowing agent said organic polyisocyanate with a polyether polyol formed by the addition of a polyhydric alcohol having a functionality of from 2 to 4 with an alkylene oxide of 2 to 4 carbon atoms in the presence of said catalyst, said organic polyisocyanate being employed in an amount sufficient to provide 0.4 to 1.5 mol equivalents of isocyanato groups per mol equivalent of hydroxyl groups, said polyether polyol having a molecular weight within the range of about 2000–7000.

4,101,471
HIGH RESILIENCY FOAM WITH IMPROVED LOAD BEARING ABILITY BY USE OF ORGANOTIN MERCAPTIDES

Robert V. Russo, Brooklyn, N.Y., assignor to M & T Chemicals Inc., Stamford, Conn.

Filed Dec. 18, 1975, Ser. No. 641,964

Int. Cl.[2] C08G *18/22, 18/63, 18/66*

U.S. Cl. 521—121 **8 Claims**

1. A method for preparing a high resiliency polyurethane foam characterized by a value for the indentation load deflection, measured at 65% deflection, greater than one pound per square inch, said method comprising reacting at least one polyol selected from the group consisting of

1. polyols exhibiting a molecular weight of between 4,500 and 6,000 and a hydroxyl number from 25 to 45,
2. polyols exhibiting a molecular weight between 4,500 and 6,000 and a hydroxyl number from 25 to 45, wherein said polyol contains between 5 and 25%, based on the weight of said polyol, of side chains derived from the graft polymerization of acrylonitrile or a mixture of acrylonitrile and styrene,
3. mixtures of polyols exhibiting a molecular weight from 4,000 to 8,000 and a diamine as a cross-linking agent, said diamine being present in an amount from about 0.5 to 6%,

based on the weight of said polyol, with a polyfunctional isocyanate, a blowing agent comprising water and from 0 to 10%, based on the weight of said blowing agent, of a volatile fluorinated hydrocarbon that boils from −40° to +70° C., a silicone-base surfactant and as the polymerization catalyst, from 0.001 to 0.1%, based on the weight of said polyol, of an organotin compound of the formula $R_2^1Sn(SR^2COOR^3)$ wherein R^1 and R^3 are individually selected from the group consisting of alkyl radicals containing from 1 to 20 carbon atoms and R^2 is a methylene or ethylene radical.

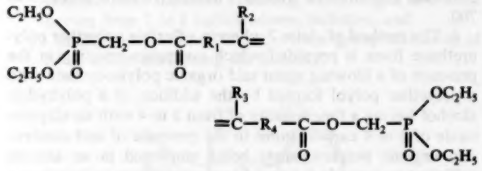
4,101,472

FLAME RESISTANCE OF FOAMS USING DIETHYL HYDROXYMETHYLPHOSPHONATE ESTERS

Jean-Marie J. Biehler, Brunstatt; Serge L. Lecolier, Janville sur Juine, and Patrice M. Le Roy, Ballancourt, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 590,124, Jun. 25, 1975, Pat. No. 4,024,207. This application Nov. 1, 1976, Ser. No. 737,214
Claims priority, application France, Jul. 4, 1974, 74 23261
Int. Cl.² C08G *18/14*
U.S. Cl. 521—85 **2 Claims**

1. The method of improving the flame resistance of a rigid or a flexible polyurethane foam or a thermoplastic polyolefin or polyester foam which comprises adding to said foam a compound which is a diester of diethyl hydroxymethylphosphonate of the formula:



wherein R_1 and R_4 are alkylene chains of formula $—(CH_2)_m—$, in which m is 0 or an integer, R_2 and R_3 are hydrogen or alkyl radicals, and the total number of carbon atoms in the radicals R_1, R_2, R_3 and R_4 is not more than 10.

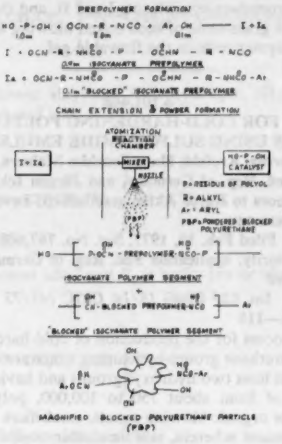
4,101,473

SOLID PARTICLE-FORM POLYMERIZABLE POLYMERIC MATERIAL AND COMPOSITIONS, STRUCTURES AND METHODS OF EMPLOYING AND PRODUCING THE SAME

Harry L. Lander, Muskegon, Mich., assignor to Story Chemical Corporation, Muskegon, Mich.

Division of Ser. No. 460,482, Apr. 12, 1974, Pat. No. 3,947,426. This application Jan. 15, 1976, Ser. No. 649,352
Int. Cl.² C08G *18/80*
U.S. Cl. 260—13 **7 Claims**

1. A composition comprising solid particle-form thermoplastic, polymerizable or cross-linkable, multi-functional polymeric material containing blocked isocyanate groups together with urea and/or urethane linkages and wherein the blocked isocyanate groups making up said polymeric material comprise only a portion of the total isocyanate groups employed to produce said polymeric material, said polymeric material upon increase in temperature sufficient to unblock said blocked isocyanate groups being capable of undergoing polymerization or cross-linking, substantially uniformly dispersed in, distributed on or admixed with a particle-form thermoplastic resin



selected from from the group consisting of polyethylene, polyvinyl chloride and polystyrene.

4,101,474

AQUEOUS BASED EPOXY SLURRY FOR FORMING A CONSOLIDATED GRAVEL PACK

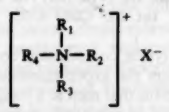
Claude T. Copeland, Tulsa, and Vernon G. Constien, Owasso, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 737,813, Nov. 1, 1976, Pat. No. 4,074,760. This application Jun. 16, 1977, Ser. No. 807,094
Int. Cl.² E21B *43/04*
U.S. Cl. 260—13 **42 Claims**

1. In a slurry suitable for use in emplacing a permeably consolidated particulate mass in communication with a permeable subterranean formation, of the type containing an epoxy resin-solvent mixture, a curing agent for the epoxy resin, a particulate material, and a coupling agent, the improvement which comprises:

(a) an aqueous based carrying fluid for the slurry, and

(b) a surfactant in the slurry, selected from the group consisting of quaternary ammonium salts corresponding to the formula



wherein: R_1 and R_3 are each independently lower alkyl, hydroxy substituted lower alkyl, or polyoxyethylene alkyl of the formula $—(CH_2CH_2O)_nH$ wherein n is 2 or 3; R_2 is an 8- through 18-carbon hydrocarbon chain; R_4 is an aliphatic hydrocarbon chain or an alkyl aryl group, containing 7 to 18 carbon atoms; and X is fluorine, chlorine, bromine, or iodine;

the components of said slurry being provided in amounts and admixed in a sequence such that a pumpable slurry is obtained from which a permeable, consolidated mass can be formed after a suitable curing time.

4,101,475
FLAME RESISTANT MATERIALS AND METHOD OF MAKING SAME

Joseph P. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 17, 1976, Ser. No. 754,926
Int. Cl.² C08G *12/32*
U.S. Cl. 260—21 **15 Claims**

1. A hardenable mixture for forming a flame retarding surfacing material consisting essentially of the following ingredients in the following approximate parts by weight:

Aluminium trihydrate	from 15 to 80
Other inorganic fillers	from 0 to 50
Aldehyde condensate resole [prepolymer]	from 15 to 45
Fatty acid salt	from 0 to 4.0
Ammonium hydroxide	from 0.1 to 3.0
Acid salt catalyst	from 0.05 to 0.5

said mixture being wetted out with sufficient water to form a handleable gel that becomes flowable at elevated temperatures before being thermoset.

4,101,476
PROCESS FOR THE MANUFACTURE OF CRYSTALLINE, CROSSLINKED, ELASTOMERIC EPOXIDE RESINS

Rolf Schmid, Gelterkinden, and Ursula Kreibich, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 680,265, Apr. 26, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,441
Claims priority, application Switzerland, Apr. 28, 1975, 5443/75
Int. Cl.² C08L *91/00, 63/00*
U.S. Cl. 260—22 EP **20 Claims**

1. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins, characterised in that epoxide compounds, containing two or more epoxide groups, are reacted

a. with polyester-polycarboxylic acids A which essentially contain segments of the formula I

$$-[O-(CH_2)_n-O.CO-(CH_2)_m-CO]_p- \quad (I)$$

in which n and m are identical or different and denote 2 or a higher number than 2, and to which the condition $n + m = 6$ to 30 applies, and in which p denotes a number from 2 to 40 which, however, is sufficiently large that the segment contains at least 30 $-CH_2-$ groups, and

b. with polyester-polycarboxylic acids B which essentially contain segments of the formula II

$$-[O-R^1-O.CO-R^2-CO]_q- \quad (II)$$

in which R^1 denotes an alkylene radical with at least 2 C atoms in the chain, in which R^2 denotes a radical which is derived from a dimerised mono- unsaturated or di- unsaturated fatty acid, and in which, per O bridge, an average of at least 3.5 and at most 30 C atoms, without taking into account the C atoms of the —CO.O— radicals, are present in the chain, and in which q denotes a number from 2 to 40, which, however, is sufficiently large that the segment contains at least 30 C atoms, without taking into account the C atoms of the —CO.O— radicals, in the chain, and

c. if appropriate, with curing agents C, and, if appropriate, in the presence of accelerators,

in a ratio such that 0.5 to 1.2 equivalents of polyester-polycarboxylic acid are present per equivalent of epoxide compound, that 1/10 to 9/10 of these 0.5 to 1.2 equivalents are attributable to the polyester-polycarboxylic acid A and the remaining 9/10 to 1/10 to the polyester-polycarboxylic acid B, and that up to 0.6 equivalent of curing agent C is present per equivalent of epoxide compound, with the proviso that, in the cases in which only difunctional epoxide compounds and difunctional polyester-polycarboxylic acids A and B are employed, the epoxide groups must be present in excess and the reaction with a curing agent C is essential.

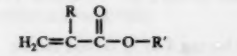
4,101,477
RADIATION CURABLE ACRYLIC RESIN COMPOSITIONS

Nelson E. Lawson, Trenton, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 604,488, Aug. 14, 1975, Pat. No. 4,035,320, and a continuation-in-part of Ser. No. 274,409, Jul. 24, 1972, abandoned, and Ser. No. 434,440, Jan. 18, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,579
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.² C09D *3/66, 3/81, 11/10*
U.S. Cl. 260—22 CB **6 Claims**

1. The polyacrylate reaction product of,

(a) an equivalent excess of an acrylic compound of the formula:



wherein R is selected from hydrogen and methyl; R′ is selected from hydrogen, methyl and ethyl; and

(b) a polyester polyol obtained by the condensation of

(i) an aliphatic polycarboxylic acid having a molecular weight of at least 325 and at least 19 carbon atoms, inclusive, said acid being a maleated fatty acid; with

(ii) an equivalent excess of an aliphatic polyol having at least two hydroxyl groups and a molecular weight of between about 60 to about 250;

said reaction of (a) and (b) being under conditions wherein said acrylic compound does not polymerize.

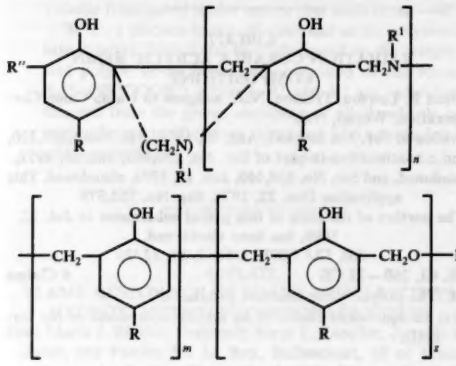
4,101,478
SYNTHETIC RUBBER MIX

Vladimir Mitrofanovich Kostjuchenko, ulitsa Komsomolskaya, 10, kv. 188; Evgeny Petrovich Panov, ulitsa Fadeeva, 41"a", kv. 34, both of, Volgograd; Arkady Grigorievich Shvarts, ulitsa Abelmanovskaya, 7, kv. 20, Moscow; Nadezhda Arkadievna Pruzhanskaya, Bolshaya Cherkizovskaya ulitsa, 9, korpus 1, kv. 105, Moscow; Natalya Yakovlevna Vasilievykh, ulitsa Malaya Gruzinskaya, 38, kv. 29, Moscow, and Galina Vasilievna Fateeva, ulitsa Karla-Marxa, 13, kv. 47, Volgograd, all of U.S.S.R.

Filed Apr. 12, 1976, Ser. No. 675,941
Int. Cl.² C08L *91/00*
U.S. Cl. 260—23 S **7 Claims**

1. A rubber mix comprising synthetic rubbers selected from the group consisting of cis-isoprene rubber, cis-divinyl rubber, butadiene-styrene rubber, ethylene-propylene rubber and butyl rubber, and mixtures thereof; sulfur as a vulcanizing agent; organic accelerators selected from the group consisting of di-(2-benzothiazolyl)-disulphide, 2-mercaptobenzothiazole, N-furfurolidene-benzothiazolyl-2-sulphenamide, diphenylguanidine, N-cyclohexyl-2-benzothiazolyl-sulphenamide, and tetramethylthiuramidisulphide; zinc oxide as a vulcanization promoter, fillers selected from the group consisting of carbon black, and a mixture of carbon black and a silicic-acid based filler; stearin as a dispersing agent, plasticizers selected from the group consisting of an aromatic oil with a viscosity of 35 to 40 cSt at 100° C, paraffin-naphthenic oil with a viscosity of 8.5 to 10 cSt at 100° C, petroleum bitumen, and indene-coumarone resin; and alkylphenolamine resin obtained by condensation of aminomethylating agents with a mixture comprising 70 to 97 weight percent of monoalkylphenols, with alkyls containing from 4 to 12 carbon atoms, and 3 to 30 weight percent of 2,4- and 2,6-dialkylphenols, with alkyls containing 4 to 12 carbon

atoms, at a temperature of 120 to 180° C, said alkylphenolamine resin being described by the general formula:



where:

R is alkyl having 4 to 12 carbon atoms;

R′ is hydrogen or substituted hydroxybenzyl;

R″ is hydrogen, or alkyl having 4 to 12 carbon atoms, or N(dimethyl)methylene amine;

n is equal to 0.1 to 5.0;

m is equal to 0–4; and

z is equal to 0 to 0.5, and having a molecular weight of 500 to 2,000, a softening point of 50° to 130° C, and a nitrogen content of 0.4 to 5 percent, said components of the rubber mix being taken in the following proportions, in parts by weight:

synthetic rubbers: 100
vulcanizing agent: 1.5–3
organic accelerators: 1–2.5
vulcanization promoter: 3–5
fillers: 40–70
dispersing agent: 1–2
plasticizers: 5–20, and
alkylphenolamine resin: 0.5–10.

4,101,479

POLYOLEFIN PHOTOSTABILIZER COMPOSITION

Carroll J. Wedel, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 614,388, Sep. 18, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,201
Int. Cl.[2] C08K *5/36, 5/09*
U.S. Cl. 260—23 H **11 Claims**

1. A composition providing resistance to the photodegradation of a polyolefin produced from C_2–C_6 monomers comprising a nickel salt of a C_3–C_{30} nonaromatic monocarboxylic acid and a thiodiester of the formula $R^1OOCR^2—S—R^3COOR^4$ in mol ratio of about 1:0.25–2, wherein R^1 and R^4, and R^2 and R^3, are hydrocarbyl groups which may be the same or different and each contains from 1 to about 20 carbon atoms.

4,101,480

PIGMENTARY PRINTING PASTE ADDITIVE

Roland Ruf, Chantilly, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Nov. 28, 1975, Ser. No. 636,271
Claims priority, application France, Nov. 15, 1974, 74 37651
Int. Cl.[2] C09D *5/02, 11/02, 11/10*
U.S. Cl. 260—23 AR **30 Claims**

1. In a pigmentary printing paste for textile fibers wherein said paste is in the form of an oil-in-water emulsion or semi-emulsion containing a water-soluble synthetic thickening agent which comprises at least 20% of dry material and which is swollen in an aqueous medium by alkaline agents and which results from the polymerization or copolymerization of at least 20% of at least one unsaturated carboxylic acid having 3 or 4 carbon atoms or an anhydride thereof, wherein said paste also contains finely dispersed pigment, binding agent in the form of a copolymer of unsaturated monomers, and an emulsifying agent; the improvement whereby said printing paste contains from 1 to 10% by weight of a liquid additive which is substantially insoluble in water, said additive comprising a nonionic surface-active liquid product which is substantially insoluble in water, and which has a molecular weight of from 1,000 to 20,000 and is the condensation product of propylene oxide or of a mixture of propylene oxide and ethylene oxide containing a greater amount of propylene oxide with a compound having at least one atom of active hydrogen which is selected from the group consisting of monoalcohols comprising methanol, ethanol, propanols, butanols and homologues thereof having less than 20 carbon atoms, polyalcohols comprising glycol, glycerol, pentacrythritol, oses having 5 to 12 carbon atoms, aliphatic mono-acids having 12 to 40 carbon atoms, aliphatic polyacids having 2 to 20 carbon atoms, their esters and ethers, aliphatic monoamines having 1 to 6 carbon atoms, aliphatic polyamines having 1 to 6 carbon atoms and at most 4 amine functions, aminoalcohols, and water.

4,101,481

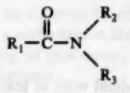
PROCESS FOR THE MANUFACTURE OF STABLE POLYCHLOROPRENE LATEX

Paul Branlard, Grenoble, and Jean Pierre Merle, Echirolles, both of France, assignors to Societe Distugil, Paris, France

Filed Jun. 27, 1977, Ser. No. 810,388
Claims priority, application France, Jul. 2, 1976, 76 20292
Int. Cl.[2] C08L *11/02*
U.S. Cl. 260—23.7 A **10 Claims**

1. In a process for the preparation of a chloroprene polymer latex by polymerizing chlorophene in an alkaline aqueous emulsion in the presence of an emulsifying agent and of a catalyst which provides free radicals, the improvement comprising

adding to said emulsion, per 100 parts of starting monomer, from 0.2 to 4 parts by weight of an amide of the formula



in which R_1 is C_3 – C_{18} alkyl or alkenyl or aryl or arylalkyl, or arylalkyl with the aryl and alkyl linked by a hetero-atom; and R_2 and R_3 are identical or different and are each hydrogen, a linear or branched C_1 – C_{12} alkyl or alkenyl or an aryl or an arylalkyl, or arylalkyl with the aryl and alkyl linked by a hetero-atom or R_1 and R_3 taken together form a heterocyclic ring with nitrogen as the hetero-atom with the proviso that, if $R_2 = R_3 = H$, the carbon in the α-position relative to the group C = O must be substituted by at least one group having a positive inductive effect and, if $R_2 = H$ and R_3 is an alkyl group, said R_3 must possess at least two carbon atoms when R_1 does not possess a group having a positive inductive effect on the carbon in that α-position relative to the group C = O of the amide, said amide being substantially insoluble in water at the concentration used, soluble in chloroprene and non-hydrolyzable by NaOH.

4,101,482

SEALANT BASED ON MIXTURE OF UNSATURATED AND HYDROGENATED BLOCK COPOLYMERS

Richard C. Doss, and Edward L. Walton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 4, 1976, Ser. No. 729,549
Int. Cl.[2] C08K 5/01; C08L 93/00
U.S. Cl. 260—27 BB 10 Claims

1. A sealant composition comprising:

5-50 parts by weight of an unsaturated block copolymer of a conjugated diene and a monovinyl-substituted aromatic compound;

50–95 parts by weight of a teleblock copolymer of a formula selected from ABA and $(AB)_nY$ wherein A represents a block of a polymerized monovinyl-substituted aromatic component, B represents a block of a polymerized conjugated diene before hydrogenation, said teleblock copolymer being hydrogenated to the extent that only 5 percent or less of the original olefinic unsaturation remains, and 5 percent or less of the monovinyl-substituted aromatic component unsaturation has been removed, Y represents a residue of a polyfunctional coupling agent or a polyfunctional initiator, and n is an integer having a value of from 2 to 4;

10–300 parts by weight of a modifying resin; and

25–250 parts by weight of a filler.

4,101,483

NON-AQUEOUS WATER-DISPLACING SEALANT COMPOSITION FOR VEHICLE GLASS JOINTS

John J. Moskal, Garfield Heights, Ohio, assignor to Premier Industrial Corporation, Cleveland, Ohio

Filed May 2, 1977, Ser. No. 792,932
Int. Cl.[2] C08K 5/34
U.S. Cl. 260—27 BB 21 Claims

1. A non-aqueous, water-displacing sealant composition for application to vehicle glass joints and the like, comprising a homogeneous mixture of:

(A) from 5% to 20% by weight of a thermoplastic rubber base, and

(B) from 0.5% to 12% by weight of a liquid plasticizer selected from the group consisting of oxidation-resistant balsamic resins and aromatic hydrocarbons, and

(C) from 1% to 20% by weight of a tackifying resin, and

(D) from 0.1% to 3% by weight of an anti-oxidant for rubber, and

(E) from 0.25% to 0.70% by weight of a cationic surfactant selected from the group consisting of imidazoline derivatives, and

(F) from zero to 48% by weight of inert inorganic solids as fillers, and

(G) from zero to 5% by weight of a bodying agent, and

(H) from 20% to 70% by weight of a liquid solvent selected from the group consisting of aliphatic and aromatic hydrocarbons, and said composition being essentially free of water and being characterized by its ability to displace water, without absorption thereof into the composition, from a water-wetted substrate to which said sealant is applied.

4,101,484

SEALANT BASED ON THERMOPLASTIC ELASTOMER AND MIXED MODIFYING RESINS

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 4, 1976, Ser. No. 729,432
Int. Cl.[2] C08L 53/02, 83/10, 93/00
U.S. Cl. 260—27 BB 8 Claims

1. A sealant composition which exhibits low surface tack after application comprising

(1) a thermoplastic elastomer having the structure ABA or $(AB)_nY$, wherein A represents a block of a polymerized monovinyl-substituted aromatic compound, B represents a block of a polymerized conjugated diene, Y represents a residue of a polyfunctional coupling agent or a polyfunctional initiator, and n is an integer having a value of 2 to 4, said thermoplastic elastomer having a weight ratio of said monovinyl-substituted aromatic compound to said conjugated diene within the range of 50:50 to 5:95, said elastomer having the unsaturation normally associated with such polymers;

(2) 10–15 parts by weight per 100 parts by weight of said thermoplastic elastomer of a poly(vinyl aromatic)-compatible modifying resin component which is an aromatic hydrocarbon;

(3) 10–150 parts by weight per 100 parts by weight of said thermoplastic elastomer of a poly(conjugated diene)-compatible modifying resin component which is nonaromatic selected from normally solid modified and unmodified rosin and rosin esters of polyhydric alcohols, normally solid esters of polymerized rosin, polyterpene resins, and resinous polyolefins derived from aliphatic and cycloaliphatic olefins; and

(4) 25–250 parts by weight per 100 parts by weight of said thermoplastic elastomer of a filler.

4,101,485

DURABLE FIRE RETARDANT FOR FOREST AND RANGELANDS

Donald L. Brooks, Manchester; Michael L. Losee, Webster Groves; Harry Teicher, and Charles R. Williams, both of St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 28, 1976, Ser. No. 691,179
Int. Cl.[2] C08L 61/28
U.S. Cl. 260—29.4 UA 6 Claims

4. A weather-durable fire retardant composition which comprises an aqueous dispersion of

(a) An ammonium salt selected from the group consisting of monoammonium orthophosphate, diammonium orthophosphate, monoammonium-alkali metal mixed orthophosphates, diammonium-alkali metal mixed orthophosphates, ammonium-alkaline earth metal mixed orthophosphates, ammonium sulfate, substantially water-insoluble ammonium polyphosphates, and mixtures thereof, wherein said ammonium polyphosphates are represented by the formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

wherein n is an integer having an average value from 20 to about 400, m/n has an average value between about 0.7 and about 1.1, and m has a maximum value equal to $n+2$.

(b) a reactive, water-soluble binder which insolubilizes upon drying; and

(c) a water-dispersible, viscosity control agent which imparts thixotropic flow properties to an aqueous dispersion, wherein (a), (b) and (c) together comprise from about 5 to 40 percent by weight of said aqueous dispersion.

4,101,486

CATIONIC ELECTRODEPOSITABLE COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Lance C. Sturni, McKeesport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1975, Ser. No. 562,086
Int. Cl.[2] C08G 18/80; C08J 3/06; C08L 63/00
U.S. Cl. 260—29.2 TN 12 Claims

1. An aqueous based resinous dispersion suitable for use as a coating composition comprising as the resinous phase:

(A) a quaternary ammonium salt group solubilized synthetic organic resin containing active hydrogens formed from reacting:

(1) a tertiary amine-acid salt with

(2) a polyepoxide which contains glycidyl groups; said oganic resin containing from 0.05 to 16 percent by weight nitrogen based on total weight of (1) and (2);

(B) a capped organic polyisocyanate stable at ordinary room temperature in the presence of said resin (A) and reactive with the active hydrogens of said resin (A) at elevated temperatures to form a cured product, cured through urethane crosslinks.

4,101,487

COATING MEDIUM

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 475,483, Jun. 3, 1974, Pat. No. 4,003,947, which is a continuation-in-part of Ser. No. 467,615, May 6, 1974, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application Aug. 13, 1976, Ser. No. 714,167

Int. Cl.[2] C08G *73/10*

U.S. Cl. 260—29.2 N **12 Claims**

1. A heat curable coating medium comprising an aromatic diamide diacid diamine formed as the reaction product of an aromatic diamine and an aromatic dianhydride, in the molar ratio of two-to-one respectively, at a temperature below that at which more than negligible imidization occurs, in an inert solvent for at least one of said reactants, a coating of said medium on a substrate being heat curable at imidization temperature to form a cured highly cross-linked polymeric coating thereon.

4,101,488

WATER-SOLUBLE HEAT-RESISTANT INSULATING VARNISH

Takashi Ishizuka, and Naoki Miwa, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Sep. 26, 1975, Ser. No. 617,135

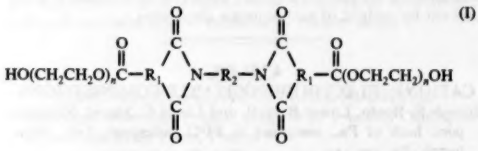
Claims priority, application Japan, Sep. 26, 1974, 49-111229

Int. Cl.[2] C08J *3/08;* **C08L** *79/08*

U.S. Cl. 260—29.2 N **25 Claims**

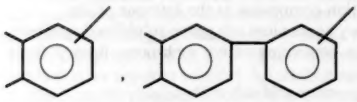
1. A water-soluble, heat-resistant, insulating varnish comprising an aqueous solution of a resin containing ester groups and imide groups in the molecule, wherein said aqueous solution of said resin is obtained by adjusting the pH of said insulating varnish to between 5 and 9 by the addition of a volatilizable basic compound, said resin consisting of the reaction product of

(A) a carboxyl-containing polyesterimide resin having an acid value of about 30 to 150 obtained by reacting (a) a polyhydric alcohol component comprising at least one organic polyhydric alcohol and further containing about 10 to 60 mol % of an imide ring-containing glycol of the general formula (I):



(I)

wherein R_1 is a trivalent aromatic group selected from the group consisting of



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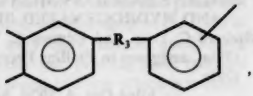
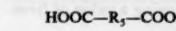


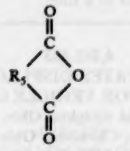
wherein R_3 is selected from the group consisting of

R_2 is a divalent organic group, and n is an integer of 1 to 3, with (b) a polycarboxylic acid component comprising at least one trivalent or divalent organic carboxylic acid or the anhydride thereof

said divalent organic carboxylic acid or the anhydride thereof represented by the general formula (VI) or (VII), respectively

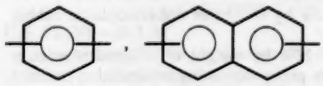


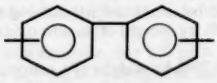
(VI)



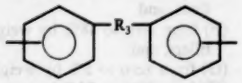
(VII)

in which R_5 is a divalent organic group selected from the group consisting of $-(CH_2)-n_2$ in which n_2 is an integer of 1 to 8,

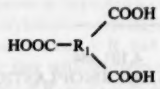




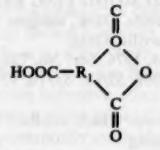
and



in which R_3 is as defined above, about 30 to 100 mol % of which comprises an aromatic tricarboxylic acid or the anhydride thereof represented by the formula (IV) or (V), respectively



(IV)



(V)

with R_1 as defined above so that the equivalent ratio (OH/-

COOH) between the polyhydric alcohol component and the polycarboxylic acid component is about 1.0 to 2.0 and wherein the amount of the imide ring-containing glycol of the general formula (I) among the total amount of the (A) component is about 20 to 70% by weight;

(B) 1,2,3,4-butanetetracarboxylic acid or an imide-forming derivative thereof capable of forming an imide ring by reaction with an organic diamine; and

(C) an organic diamine, wherein the total amount of (B) and (C) is about 20 to 200 parts by weight per 100 parts by weight of said polyesterimide resin (A).

4,101,489
WATER-SOLUBLE PHENOL/FORMALDEHYDE CONDENSATION PRODUCTS

Gunther Reitz, Cologne, and Günther Boehmke, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1977, Ser. No. 774,455

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609531

Int. Cl.² C08L *61/08*

U.S. Cl. 260—29.3 **7 Claims**

1. Dispersing agent which is the reaction product of

1. a mononuclear phenol/formaldehyde/bisulfite condensation product resulting from the condensation of 0.9–1.1 mols of each of formaldehyde and bisulfite per mol of phenol in an aqueous medium in the presence of a basic catalyst, and

2. per mol of phenol in said condensation product

a. 0.8–1.1 mols of formaldehyde or

b. 0.8–4.0 mols of formaldehyde and 0.1–2.0 mols of a nitrogen-containing compound capable of reacting with at lease two equivalents of formaldehyde.

4,101,490
PROCESS FOR PREPARING AQUEOUS EMULSIONS OF ADDITION POLYMERS WITH BUILT-IN EMULSIFIER

Dick A. Pons, Maassluis, and Anno Bijker, Spijkenisse, both of Netherlands, assignors to Synres International B.V., Hoek van Holland, Netherlands

Filed Sep. 20, 1976, Ser. No. 725,119

Claims priority, application Netherlands, Sep. 25, 1975, 7511275

Int. Cl.² C08L *33/08*

U.S. Cl. 260—29.6 MP **9 Claims**

1. A process for preparing emulsions of addition polymers in water by polymerizing one or more olefinically unsaturated monomers in aqueous emulsion in the presence of a suitable catalyst system and one or more emulsifiers and various other conventional additives, wherein the emulsifier is at least one compound of the formula

(RO) (TO)PO(OH)

where RO represents the residue remaining after the removal of the hydroxyl hydrogen from an unsaturated polymerizable alcohol of 2 to 12 carbon atoms, or an ABO group, wherein

A represents the residue remaining after the removal of the acid hydrogen from an olefinically-unsaturated carboxylic acid of from 3 to 25 carbon atoms, and

B is a aliphatic or cyclo-aliphatic radical of from 2 to 20 carbon atoms, or a polyoxyalkylene radical of from 2 to 100 units, or an oxyalkylene polylactone radical of a molecular weight between 200 and 1000,

and wherein the bonding between A and B is carbon bonded to oxygen bonded to carbon,

and wherein TO is

(a) an aliphatic - oxy radical of from 6 to 22 carbon atoms or

(b) a polyoxyalkylated alkylphenoxy radical of from 7 to 30 carbon atoms containing from 1 to 40 polyoxyalkylene units, or

(c) a polyoxyalkylated higher alkoxy radical of from 6 to 22 carbon atoms and containing from 1 to 40 oxyalkylene units, or

(d) a monoalkylether of an ethylene oxide/propylene oxide block copolymer, wherein the alkyl group contains from 1 to 15 carbon atoms, or

(e) a monoalkylether of polypropylene oxide wherein the alkyl group contains from 1 to 15 carbon atoms.

4,101,491
ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES AND POLYMERS THEREOF

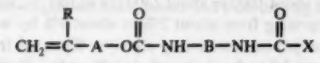
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 734,916

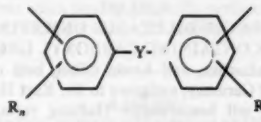
Int. Cl.² C08L *35/02*

U.S. Cl. 260—29.6 T **11 Claims**

1. A latex comprising (A) water and (B) a polymer comprising from about 0.1 percent to 100 percent by weight of polymerized units of an ethylenically unsaturated blocked aromatic diisocyanate of the formula



wherein R is hydrogen or a methyl or ethyl radical; A is a carbonyloxyalkylene radical containing 2 to about 8 carbon atoms or an aralkylene radical containing 7 to about 12 carbon atoms; B is a bivalent aromatic radical selected from the group consisting or arylene, naphthalene, and the structure



where R is defined as above; Y is O, S, or $-CH_2-$; $n = 0$ to 3; and X is the radical fragment remaining after a hydrogen atom is removed from the nitrogen atom of an oxime, benzimidazole, pyrazole, benzotriazole, caprolactam, thiocaprolactam, or p-nitroaniline, and up to 99.9 percent by weight of polymerized units of a copolymerizable vinylidene monomer.

4,101,492
AQUEOUS EMULSION COPOLYMERS CONTAINING LOWER ALKYL HYDROGEN POLYSILOXANE

Martin K. Lindemann, Greenville, and Donald M. Wacome, Greer, both of S.C., assignors to Chas. S. Tanner Co., Greenville, S.C.

Filed Mar. 3, 1977, Ser. No. 772,961

Int. Cl.² C08F *283/12*

U.S. Cl. 260—29.6 NR **19 Claims**

1. An aqueous emulsion comprising water having emulsified therein particles of copolymer produced by copolymerization in aqueous emulsion of nonreactive polymerizable monoethylenically unsaturated monomers providing a Tg below about 20° C. with from 0.5% to 20% of reactive monoethylenically unsaturated monomer providing active hydrogen and from 1 to 40% of a terminal-blocked lower alkyl hydrogen polysiloxane having a viscosity in the range from 20 to 1,000 cP at 20° C., the ratio of alkyl groups to Si-H groups in said siloxane being in the range of from 13:1 to about 1:1, the terminal groups not being included in said ratio.

4,101,493

CROSSLINKING EMULSION

Teruo Nakagawa; Takahisa Ogasawara, and Hidemaro Tatemichi, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1976, Ser. No. 704,819
Claims priority, application Japan, Jul. 17, 1975, 50-86717
Int. Cl.[2] C08L *33/08*
U.S. Cl. 260—29.6 R **10 Claims**

1. An emulsion of a crosslinking type which comprises an oligoester-(meth)acrylate having at least two (meth)acryloyl groups per molecule, a molecular weight of not more than 1000 per one (meth)acryloyl group, and a boiling point at normal atmospheric pressure of at least 200° C, and
a polymer emulsion of an oil-in-water type.

4,101,494

TIRE SEALING AND BALANCING AGENT

Jerry B. Kent, and Peter P. Augostini, both of Arlington, Tex., assignors to Wobaco Trust, Ltd. Trustee, Nassau, The Bahamas

Filed Aug. 9, 1976, Ser. No. 712,516
Int. Cl.[2] C08J *3/20*
U.S. Cl. 260—29.6 B **13 Claims**

1. A tire sealing and balancing composition having a viscosity of from about 1000 to about 2200 cps at 100° F., said composition comprising from about 2% to about 8% by weight of a fibrous component containing asbestos fibers of from about 0.01 to about 3.0 inches in length and fiberglass fibers of about 0.25 inches to 0.125 inches in length the ratio of asbestos fibers to fiberglass fibers being from about 20:1 to about 100:1 and an aqueous solution of a water soluble polyvinyl alcohol wherein the ratio by weight of polyvinyl alcohol to water is from about 0.5:100 to about 5.0:100.

4,101,495

MODIFIED WATER-DILUTABLE DIOLEFIN POLYMER OILS CONTAINING CARBOXYL GROUPS

Hans-Peter Patzschke, and Armin Göbel, both of Wuppertal, Fed. Rep. of Germany, assignors to Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung vorm. Otto Louis Herberts, Wuppertal, Fed. Rep. of Germany

Filed Dec. 1, 1975, Ser. No. 636,369
Claims priority, application Austria, Dec. 2, 1974, 129609/74
Int. Cl.[2] C08L *47/00*
U.S. Cl. 260—29.7 NR **17 Claims**

1. A modified, water-dilutable conjugated diolefin polymer oil containing carboxyl groups, obtained by the steps including reacting an α, β-unsaturated compound selected from a monocarboxylic acid, a dicarboxylic acid, a dicarboxylic anhydride, a dicarboxylic acid (semi) ester, a dicarboxylic acid (semi) amide, a dicarboxylic acid imide, and mixtures thereof, with an diolefin polymer oil component substantially free from carboxyl groups, wherein the modified polymer oil is prepared by reacting

A. the reaction product of at least one of said α,β-unsaturated compounds with a mixture containing
   a. from about 80 to 99 parts by weight, of a conjugated diolefin polymer oil substantially free from carboxyl groups with an average molecular weight of from about 500 to 2500, and
   b. from about 1 to 20 parts by weight, of an olefin polymer oil substantially free from carboxyl groups, selected from degraded rubber, liquid butadiene copolymer and a readily soluble diolefin block copolymer, having an average molecular weight of from about 4500 to 20,000, with

B. from about 3 to 15 parts by weight, based on 100 parts by weight of component A of a liquid conjugated diolefin polymer oil substantially free from carboxyl groups which has not been reacted with said α,β-unsaturated compound and the average molecular weight of which is between the average molecular weights of components (Aa) and (Ab).

4,101,496

HIGHLY PIGMENTABLE, LIQUID COATING COMPOSITIONS

Jörg Dörffel, Marl; Werner Andrejewski, Gahlen, and Uwe Biethan, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 2, 1975, Ser. No. 637,017
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1974, 2457775
Int. Cl.[2] C08L *61/24, 61/28, 67/02*
U.S. Cl. 260—31.2 R **9 Claims**

1. In a liquid coating composition containing 0–25% solvent and a binder consisting essentially of

A. 45–10% by weight of an aminoplast, a low-molecular weight precursor thereof, or a mixture thereof; and

B. 55–90% by weight of a polyester, or mixture thereof, whose end groups are predominantly hydroxy prepared by condensing an alcohol component consisting of:
   I.1 0–30 molar percent of one or more aliphatic polyols having 3 or 4 hydroxy groups and 3–6 carbon atoms, and
   I.2 100–70 molar percent of a mixture of ethylene glycol and 1,2-propanediol,

with an acid component whose predominant acid is hexahydroterephthalic acid; or a binder which is the condensation product of said aminoplast component, or the starting materials for the production thereof, with said polyester component, the improvement wherein

(i) the polyester or mixture of polyesters of component (B) have a degree of condensation of between 2.5 and 10.5 and an average molecular weight of up to 1,000, and the
(ii) the mixture of ethylene glycol and 1,2-propanediol consists of 33–90 molar percent of ethylene glycol and 67–10 molar percent of 1,2-propanediol, and
(iii) the acid component mixture consists essentially of at least 80 molar percent of hexahydroterephthalic acid, one or more derivatives thereof, or a mixture thereof.

4,101,497

SEALANT-PRIMER COATING

Everett Charves, Holland; David F. Pulley, Warrington, and Arthur O. Stander, Jenkintown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1976, Ser. No. 747,461
Int. Cl.[2] C08K *5/10*
U.S. Cl. 260—31.2 N **1 Claim**

1. A method for preparing a protective coating composition, comprising:
forming a first component by mixing, in parts by weight,

epoxy resin having an epoxide equivalent between 185 and 196, viscosity between 110 and 160 poises, and density between 9.6 and 9.8 lbs./gal. at 68° F	291
strontium chromate	1701
titanium dioxide	319
magnesium silicate	788
diatomaceous silica	414
leveling agent	135
methyl n-butyl ketone, urethane grade	3386

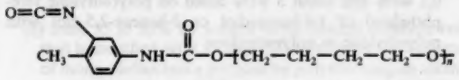
forming a second component by mixing, in parts by weight,

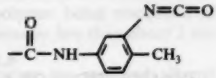
ketimine curing agent	1680
methyl ethyl ketone, urethane grade	2754

forming a third component by mixing, in parts by weight,

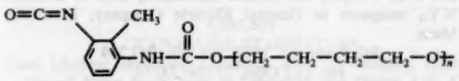
aromatic polyurethane resin having a 100% modulus of 400 psi at 100° C and an available isocyanate content of 2.8%	1740
polyurethane resin having a 100% modulus of 1100 psi at 100° C and an available isocyanate content of 4.1%	873
xylene, urethane grade	1214
butyl acetate, urethane grade	699
toluene, urethane grade	634

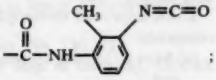
wherein said polyurethane resins are selected from the group consisting of a compound having the formula





and a compound having the formula





and combining said first, second and third components in equal parts by volume.

4,101,498

FIRE-RESISTANT COMPOSITION

John L. Snyder, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1976, Ser. No. 690,762

Int. Cl.[2] C08K *5/01*; C08L *51/00*

U.S. Cl. 260—33.6 AQ **10 Claims**

1. An oil-resistant, fire-resistant polymer composition comprising:

(a) 100 parts by weight of a block copolymer having at least two polymer end blocks A and at least one polymer mid block B, each block A being a non-elastomeric polymer block of a monoalkenyl arene having an average molecular weight of between about 2,000 and about 125,000 and each block B being an elastomeric hydrogenated polymer block of a conjugated diene, having an average molecular weight between about 10,000 and about 250,000;

(b) 0–200 parts by weight of an extending oil;

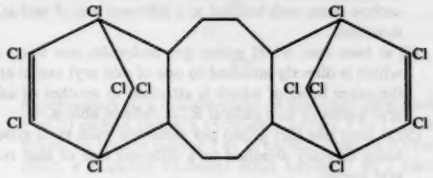
(c) 10–300 parts by weight of a polymeric alpha-olefin;

(d) 0–200 parts by weight of an inorganic filler;

(e) 5–100 parts by weight of antimony trioxide;

(f) 5–100 parts by weight of a zinc borate; and

(g) 20–300 parts by weight of a flame retardant selected from the group consisting of a perchloropentacyclodecane, the adduct



and mixtures thereof.

4,101,499

POLYORGANOSILOXANES CONTAINING HOMOGENEOUSLY DISTRIBUTED FILLERS

Joachim Herzig, Leichlingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 30, 1976, Ser. No. 709,978

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535334

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB **11 Claims**

1. A process for the preparation of a storage-stable homogeneously filled polyorganosiloxane comprising forming a mixture of polyorganosiloxane, water and a modifying agent of the formula

$$(R_3Si)_nX$$

in which

R is an optionally substituted hydrocarbon radical with up to 10 C atoms,

X is a halogen, OH, OR, N, S, OOCR or NY,

Y is hydrogen or any of the definitions of R, and

n is 1, 2 or 3,

adding thereto silica having a specific surface area of at least $50m^2/g$, and subsequently cold curing the filled polyorganosiloxane.

4,101,500

BRAKE LINING COMPOSITIONS HAVING FRICTION PARTICLES OF AN AROMATIC AMINE MODIFIED NOVOLAC RESIN AND AN AROMATIC CARBOXYLIC COMPOUND

Philip H. Brodsky, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1976, Ser. No. 735,710

Int. Cl.[2] C08L *61/10, 61/14*

U.S. Cl. 260—38 **14 Claims**

1. In a brake lining composition comprising friction particles and a resin binder therefor, wherein said improvement comprises, said friction particles comprising a thermoset reaction product of

(A) an aromatic amine modified novolac resin characterized by having:

(1) a number average molecular weight of from about 200 to 1000,

(2) at least two aryl moieties per molecule, the aryl nucleus of each aryl moiety containing from 6 through 10 carbon atoms each,

(3) at least one divalent bridging moiety of the formula:

wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen, lower alkyl, lower alkalene, lower haloalkyl aryl of from 6 through 12 carbon atoms and haloaryl of 6 through 12 carbon atoms, said

bridging moiety having the unsatisfied valences of its carbon atom each bonded to a different one of said aryl moieties,

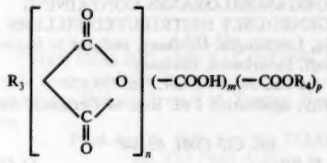
(4) at least one >NH group per molecule, one bond of which is directly attached to one of said aryl nuclei and the other bond of which is attached to another of said aryl nuclei or to a radical R_1 as defined above,

(5) at least one OH group per molecule each such group being directly attached to a different one of said two aryl nuclei,

(6) a percent oxygen acetyl of from about 3 to 26, and

(7) a percent nitrogen acetyl of from about 3 to 26, and

(B) an aromatic polycarboxylic compound of the formula:



in which R_3 is an aromatic radical of three, four, five or six valences and containing from 6 to 24 carbon atoms, R_4 is a monovalent hydrocarbon radical containing less than 19 carbon atoms; n is an integer of from 0 through 3; m is an integer of from 0 through 6; p is an integer of from 0 through 6; when n is 0, the sum of $m+p$ is an integer of from 3 through 6; when n is 1, the sum of $m+p$ is an integer of from 1 through 4; when n is 2, the sum of $m+p$ is an integer of from 0 through 2; and the sum of n and p is always at least 1,

(C) the relative proportions of said amine modified resin and said aromatic polycarboxylic compound being such that said composition is thermoset by heat said thermoset friction particles being infusible at temperatures above 700° F., being dispersed in and held in place by said binder resin.

4,101,501

HARDENABLE ONE-COMPONENT SUBSTANCE, METHOD OF PRODUCING AND HARDENING SAME AND ITS APPLICATION

Rudolf Hinterwaldner, Kastanienstrasse 13, D 8-Munich 90, Germany

Filed Aug. 13, 1976, Ser. No. 714,331

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1975, 2536319

Int. Cl.² C08K *9/10*

U.S. Cl. 260—40 R **16 Claims**

1. In a hardenable composition of the type composed of a mixture of a first component of a monomeric, oligomeric or polymeric compound and a hardening promoting agent wherein one or both of the first component and the hardening agent is encased in a protective casing which prevents the reaction and subsequent hardening of the composition until rupture of the casing and which further contains a casing rupturing agent, the improvement which comprises said rupturing agent being microspheres which break under the pressure applied in the normal use of the composition into fragments possessing angular edges or which are acutely tapered.

4,101,502

INTERPOLYMERS OF POLY (BUTYLENE TEREPHTHALATE)

Ghazi Khattab, Succasunna, and Gerard P. Naviello, Jersey City, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,796

Int. Cl.² C08K *7/14*

U.S. Cl. 260—40 R **7 Claims**

1. A composition of matter comprising a blend of:

a. between about 2 and about 60 wt% glass fibers, and

b. between about 40 and 98 wt% of a graft copolymer of poly(butylene terephthalate) containing between about 0.1 wt% and about 3 wt% based on poly(butylene terephthalate) of 1,4-butenediol or 3-hexene-2,5-diol with polyethylene or polypropylene.

4,101,503

COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN AND HIGH MOLECULAR WEIGHT ALKENYL AROMATIC RESINS MODIFIED WITH EPDM RUBBER

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,249

Int. Cl.² C08L *71/04, 23/16*

U.S. Cl. 260—42.18 **29 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about 2 microns,

wherein the improvement comprises the modified alkenyl aromatic resin having an intrinsic viscosity of at least 0.50 dl/g.

4,101,504

HIGH IMPACT COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN AND ALKENYL AROMATIC RESINS MODIFIED WITH EPDM RUBBER

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,251

Int. Cl.² C08L *71/04, 23/16*

U.S. Cl. 260—42.18 **30 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about two microns,

wherein the improvement comprises the modified alkenyl aromatic resin containing at least 8% by weight of rubbery interpolymer.

4,101,505

COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN AND EPDM RUBBER-MODIFIED ALKENYL AROMATIC RESINS HAVING SPECIFIED GEL CONTENT

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,252
Int. Cl.[2] C08L *71/04, 23/16*
U.S. Cl. 260—42.18 **30 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about 2 microns,

wherein the improvement comprises the modified alkenyl aromatic resin containing at least 2% by weight of toluene-insoluble gel.

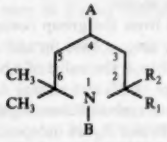
4,101,506

CYANAMIDE STABILIZERS

Paul Uhrhan; Reinhard Lantzsch, both of Cologne; Harald Oertel; Ernst Roos, both of Odenthal, and Dieter Arlt, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 6, 1976, Ser. No. 730,202
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545646
Int. Cl.[2] C08K *5/34;* **C07D** *211/06*
U.S. Cl. 260—45.8 N **7 Claims**

1. Cyanamides corresponding to the general formula (I):



(I)

in which

(a) where B is a cyano group, A represents an O—R_3 group, where R_3 represents a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms, an aromatic hydrocarbyl having 7 to 12 carbon atoms, or hydrogen, an

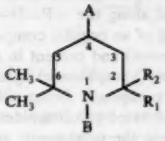
group, where R_4 and R_5 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 20 carbon atoms, a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms or an aromatic hydrocarbyl carbonyl having 7 to 12 carbon atoms, in addition to which R_5 may also represent H, or A may, together with the carbon atom in the 4 position of the piperidine ring represent a >C=O group, or

(b) where B is H, a straight-chain or branched alkyl having 1 to 20 carbon atoms, an alkenyl or alkynyl having 3 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms or the group—CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl, A represents a group

R_7 represents H, a straight-chain or branched alkyl having 1 to 20 carbon atoms, a cycloalkyl having 5 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms, a β-cyanoethyl, a β-alkoxy carbonyl ethyl having 1 to 3 carbon atoms in the alkoxy moiety, an aryl having 6 to 14 carbon atoms or the group —CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl,

and R_1 and R_2 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 12 carbon atoms or, together with the ring carbon atom to which they are attached, form a cycloalkyl ring having 5 to 12 carbon atoms.

4. A process for stabilising synthetic polymers, wherein the polymers have added to them active quantities of cyanamides corresponding to the general formula:



(I)

in which

(a) where B is a cyano group, A represents an O — R_3 group, where R_3 represents a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms, an aromatic hydrocarbyl carbonyl having 7 to 12 carbon atoms, or hydrogen, an

group, where R_4 and R_5 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 20 carbon atoms, a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms or an aromatic hydrocarbyl carbonyl having 7 to 12 carbon atoms, in addition to which R_5 may also represent H, or A may, together with the carbon atom in the 4 position of the piperidine ring represent a >C=O group, or

(b) where B is H, a straight-chain or branched alkyl radical having 1 to 20 carbon atoms, an alkenyl or alkynyl having 3 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms or the group —CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl, A represents a group

where R_7 represents H, a straight-chain or branched alkyl having 1 to 20 carbon atoms, a cycloalkyl having 5 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms, a β-cyanoethyl, a β-alkoxy carbonyl ethyl having 1 to 3 carbon atoms in the alkoxy moiety, an aryl having 6 to 14 carbon atoms or the group —CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl,

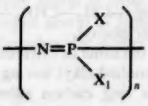
and R_1 and R_2 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 12 carbon atoms or, together with the ring carbon atom to which they are attached, form a cycloalkyl ring having 5 to 12 carbon atoms.

4,101,507
STABILIZATION OF POLYPHOSPHAZENES

Delmar Frederick Lohr, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 21, 1977, Ser. No. 779,390
Int. Cl.[2] C08K 5/34
U.S. Cl. 260—45.8 N 15 Claims

1. A poly(phosphazene) composition stabilized against thermal aging comprising (1) a poly(phosphazene) represented by the general formula:



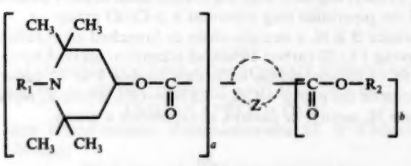
wherein *n* represents an integer from 20 up to about 50,000 and X and X_1 each represent a monovalent substituent selected from the group consisting of alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, hydroxy, and amino, and X and X_1 are randomly distributed along the —P═N— backbone, and (2) a stabilizer consisting of an organic compound compatible with said poly(phosphazene) and present in an amount sufficient to stabilize said poly(phosphazene) against thermal degradation, said organic compound being selected from the group consisting of substituted picolinamides and substituted thiopicolinamides wherein the substituents are selected from the group consisting of hydroxy, alkyl, aryl, alkoxy and halogen and an amount of a basic oxide sufficient to render said picolinamide effective as a stabilizer, and said basic oxide is selected from the group consisting of MgO and ZnO.

4,101,508
2,2,6,6-TETRAMETHYL-4-PIPERIDYL BICYCLIC HEPTANE AND OCTANE CARBOXYLIC ACID ESTERS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,561
Int. Cl.[2] C08K 5/34; C07D 211/46, 211/94
U.S. Cl. 260—45.8 N 26 Claims

1. A 2,2,6,6-tetramethyl-4-piperidyl ester of bicyclic heptane and octane carboxylic acids useful as a stabilizer for organic polymeric materials, and having the general formula:



wherein:

R_1 is selected from the group consisting of hydrogen and O,

R_2 is selected from the group consisting of alkyl; alkenyl; cycloalkyl; aryl; alkaryl; aralkyl;

a is selected from the group consisting of 1, 2, 3 and 4;

b is selected from the group consisting of 0, 1, 2 and 3; and

$a + b$ is 1, 2, 3 or 4; and

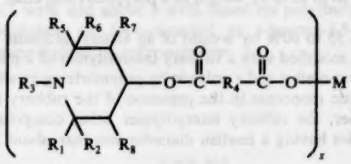
Z is a bicyclic heptane or octane ring having from seven to eight ring carbon atoms, and having from zero to four substituents selected from the group consisting of halogen, alkyl, cycloalkyl and aryl; the alkyl having from one to about six carbon atoms; the cycloalkyl having from three to about eight carbon atoms, and the aryl having from six to fourteen carbon atoms.

4,101,509
HINDERED PIPERIDINE CARBOXYLIC ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,910
The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.
Int. Cl.[2] C08K 5/17; C07D 211/46
U.S. Cl. 260—45.75 N 24 Claims

1. A compound of the formula



I

wherein

R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl, or acyl,

R_4 is straight-chain alkenylene of 2 to 4 carbon atoms, 1,2-cycloalkylene or 1,2-cycloalkenylene having 4 to 6 carbon atoms, 2,3-bicycloalkylene or 2,3-bicycloalkenylene having 7 to 8 carbon atoms or 1,2-, 1,3- or 1,4-phenylene, or a straight-chain alkylene of 1 to 4 carbon atoms substituted by alkyl or alkenyl of 1 to 18 carbon atoms, provided that the straight-chain alkylene substituted by alkyl has in total more than 8 carbon atoms,

M is a metal selected from the group consisting of, nickel, manganese, copper, zinc, cobalt, tin and dialkyl tin,

z has a value of from 1 to 4, the value of *z* being the same as the available valence of M, and either

(a) R_5 is alkyl of 2 to 6 carbon atoms, R_6 is alkyl of 1 to 6 carbon atoms, and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms, provided that R_7 and R_8 are not both hydrogen, or

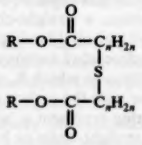
(b) R_5 and R_6 together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted with a methyl group and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms.

15. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing

(a) 0.005% to 5% of a stabilizing compound according to claim 1,

(b) 0 to 5% of a hindered phenolic antioxidant,

(c) 0 to 5% of a thio co-stabilizer



wherein R is an alkyl group having from 6 to 24 carbon atoms, and *n* is an integer from 1 to 6, and

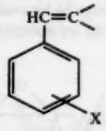
(d) 0 to 5% of a U.V. absorber.

4,101,510
FIRE RETARDANT POLYMER

James Spanswick, Wheaton, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 635,169, Nov. 25, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,933
Int. Cl.[2] C08K *3/38*
U.S. Cl. 260—45.75 B 14 Claims

1. A flame retardant thermoplastic composition comprising:
(a) a thermoplastic resin comprising an effective amount of at least one substituted vinyl aromatic monomer and at least one monomer selected from the group consisting of ethylene, propylene, and styrene, whereinsaid substituted vinyl aromatic monomer has the structure:



where X is $-CH_2Cl$, $-CH_2Br$, $-CH_2OH$, $-SO_3H$,

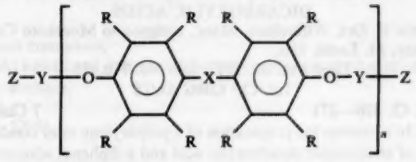
$-CHO$, $-CO_2R$, $-CH(CH_3)_2$ or $-C(O)CH_3$ and R is an alkyl group containing 1 to 6 carbon atoms; and
(b) an effective amount of a Lewis acid or Lewis acid precursor, which forms a char that inhibits flame propagation.

4,101,511
NOVEL BISPHENOL DERIVATIVES AND USES THEREOF

Joseph C. Floyd, Baytown, Tex., and Don A. Plank, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

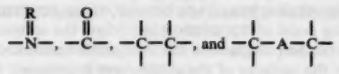
Division of Ser. No. 711,705, Aug. 5, 1976, Pat. No. 4,032,510, which is a continuation-in-part of Ser. No. 597,245, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 441,457, Feb. 11, 1974, abandoned. This application Mar. 21, 1977, Ser. No. 779,903
Int. Cl.[2] C08K *5/37*
U.S. Cl. 260—45.85 T 19 Claims

13. A composition of matter comprising an oxidatively degradable hydrocarbon and an effective amount of a stabilizer having the following structural formula:

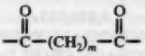


wherein:
(1) R is selected from the group consisting of —H, C_1–C_{18} alkyl groups, and an aryl group;
(2) X is selected from the group consisting of —S—,

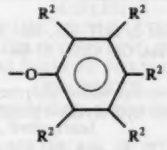
—SO—, $-SO_2-$, —



wherein A is a C_1–C_{16} alkylene or an arylene group;
(3) Y is



wherein *m* is 0 or an integer ranging from 1 to 10
(4) Z is selected from the group consisting of

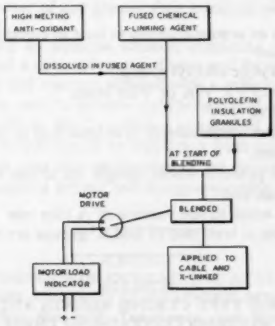


and —O—R^3 wherein R^2 is —H or a C_1–C_{18} alkyl group or —OH, and R^3 is a C_1–C_{18} alkyl group; and
(5) *n* is a value ranging from 1 to about 15.

4,101,512
DISPERSION OF ANTIOXIDANT IN CROSS-LINKABLE POLYETHYLENE

Gertraud A. Schmidt, Long Branch, and Louis A. Bopp, Fair Haven, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Aug. 23, 1976, Ser. No. 716,688
Int. Cl.[2] C08K *3/24*
U.S. Cl. 260—45.95 C 8 Claims



1. The method of dispersion of an antioxidant, that has a melting point higher than the softening point of pellets of an electric cable polyolefin insulation into which a quantity of the antioxidant must be dispensed, which method comprises dissolving the antioxidant in a fused cross-linking agent which must be dispensed throughout the insulation for subsequent cross-linking of the polyolefin, said cross-linking agent having a substantially lower melting point than the antioxidant and the solution having a melting point substantially lower than the softening point of the pellets of insulation, dissolving the antioxidant, while in solid phase, in the cross-linking agent before bringing either of the ingredients of the solution into contact with the pellets of insulation, using an antioxidant and cross-linking agent that make a solution which is absorbed into the pellets to distribute the antioxidant and cross-linking agent into the pellets of the polyolefin, adding the solution, in the molten

condition to the pellets of the polyolefin and tumbling the pellets and solution in a ribbon blender, at temperatures above the melting point of the solution but below the softening temperatures of the pellets, until the solution is uniformly distributed over the surfaces of the pellets, and continuing the tumbling in the ribbon blender until the uniformly distributed solution is absorbed by the pellets through the surfaces thereof and throughout the mass of each of the polyolefin pellets.

4,101,513

CATALYST FOR CONDENSATION OF HYDROLYZABLE SILANES AND STORAGE STABLE COMPOSITIONS THEREOF

Frederick J. Fox, Woodbury; Richard W. Noren, St. Paul, both of Minn., and George E. Krankkala, North Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 2, 1977, Ser. No. 764,817
Int. Cl.[2] C08G *77/04*
U.S. Cl. 526—193 **44 Claims**

1. An anhydrous, storage-stable, polymerizable composition comprising at least one hydrolyzable silane represented by the formula:

$$X_mSiR_{4-m}$$

wherein
X is a hydrolyzable group or hydrogen,
R is a hydrocarbyl group, and
m is 2, 3, or 4,
and an organic aromatic onium ctalyst comprising an aromatic adduct of (1) a diaromatic, triaromatic, or tetraaromatic organoatomic cation of a Group Va, VIa, or VIIa atom and (2) an anion, said onium catalyst being represented by the formula:

$$(R^2)_n—\underset{\displaystyle (R^1)_a}{\overset{\displaystyle |}{A^+}}\ X^-$$

wherein R^2 is an aromatic group at least as electron withdrawing as benzene,
R^1 is an alkyl or alkenyl group,
A is a Group Va, VIa, or VIIa atom,
X is an anion,
n is a positive whole integer of at least 2 up to the valence of A plus one,
a is 0 or a positive whole integer up to the valence of A minus one, and
n plus a is equal to the valence of A plus one
and wherein at least two of said R^2 groups are bonded to A.

4,101,514

IMIDAZOLE TYPE CURING AGENTS AND LATENT SYSTEMS CONTAINING THEM

Karl Friedrich Thom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 55,981, Jul. 17, 1970, abandoned. This application Sep. 15, 1976, Ser. No. 723,601
Int. Cl.[2] C08G *59/68, 59/56*
U.S. Cl. 528—109 **6 Claims**

1. A latent reactive system which reacts at temperatures above 50° C. comprising a first compound containing the 1,2 epoxy group and a second compound of the formula

$$ML_n(O—SO_2—R_f)_m$$

wherein
L is selected from the group consisting of imidazole and halogen or hydrocarbon derivatives thereof,
M is a metal selected from Groups VIII, IB, and IIB, of the Periodic Table,
n is a coordination number of M,
R_f is a fluorinated alkyl group of 1–18 carbon atoms, and
m is the valence of M.

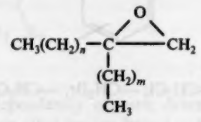
4,101,515

2,2-DIALKYLEPOXIDES

Robert Malone Gipson; Ernest Leon Yeakey, and William Jennings Peppel, all of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Division of Ser. No. 560,531, Mar. 20, 1975, abandoned, which is a division of Ser. No. 461,550, Apr. 17, 1974, Pat. No. 3,897,383, which is a division of Ser. No. 263,678, Jun. 16, 1972, Pat. No. 3,835,166. This application Sep. 27, 1976, Ser. No. 726,859
Int. Cl.[2] C08L *63/00;* C08G *57/14*
U.S. Cl. 252—182 **2 Claims**

1. A process for reducing the viscosity of epoxy resins comprising admixing therewith an epoxide compound of the following formula:



wherein *n* and *m*, individually, are integers in the range of 3 to 7 and the sum of *n* and *m* is an integer in the range of 8 to 10; and wherein from about 1 to 25 parts by weight of said epoxide is employed per 100 parts by weight of said epoxy resin.

4,101,516

CLEAR AND COLORLESS EPOXIDE DIANHYDRIDE CURED RESINS

Walter P. Barie, Jr., Shaler Township, Allegheny County, and James T. Eurich, Winfield Township, Butler County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 10, 1976, Ser. No. 749,251
Int. Cl.[2] C08G *59/42*
U.S. Cl. 528—112 **11 Claims**

1. A powdered resin mixture which will cure to a clear, substantially colorless hard resin comprising 5-phenyl-5-methylhexane-1,2,3,4-tetracarboxylic acid dianhydride and an epoxy resin having an epoxy equivalent value greater than one and an epoxy equivalent weight between about 400 and about 4,000, and a ratio of anhydride equivalents to epoxy equivalents of between 1.0 and about 1.5.

4,101,517

PREPARATION OF POLYESTERS OF 1,2-BIS(HYDROXYPHENYL)ETHANES AND AROMATIC DICARBOXYLIC ACIDS

Morris R. Ort, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 22, 1977, Ser. No. 770,955
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—271 **7 Claims**

1. In a process for preparation of a polyarylene ester condensate of an aromatic dicarboxylic acid and a diphenol admixture comprising at least 75 mol percent 1,2-bis(4-hydroxyphenyl)ethane by melt condensation of the aromatic dicarboxylic acid and the 1–7 carbon aliphatic carboxylic acid diester of the diphenol admixture in substantially stoichiometric proportions up to 10 molar percent excess of the diacid or the diester, at a temperature in the range of from 240° to 350° C. to yield a condensate of inherent viscosity of at least about 0.3 determined at 25° C. in a 60/40 weight mixture of phenol and sym-tetrachloroethane at a concentration of 0.5 g. per deciliter, the improvement which comprises carrying out the melt condensation in the presence of a catalytic amount of a potassium compound selected from the group consisting of potassium

hydroxide, potassium carbonate and the potassium salts of lower fatty acids containing from 1 to 7 carbon atoms.

4,101,518

RESIN COMPOSITION FOR POWDER COATINGS

Shigeru Takamori, Osaka; Kazutaka Yamashita, and Yoshinao Kono, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

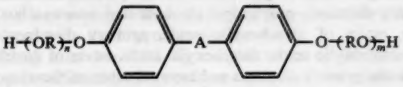
Filed Mar. 28, 1977, Ser. No. 781,772
Claims priority, application Japan, Apr. 16, 1976, 51-43187
Int. Cl.[2] C08L *63/00*
U.S. Cl. 528—100 **11 Claims**

1. A resin composition for powder coating compositions consisting essentially of

(A) a polycarboxylic acid obtained by reacting

(1) a polycarboxylic acid formed by reacting

(i) a polyoxyalkylene ether of a dihydric phenol having the formula:



wherein A is alkylene having 1 to 4 carbon atoms or carbonyl, R is alkylene having 2 to 4 carbon atoms. and each of *m* and *n* is a number of at least 1 and the sum of *m* and *n* is in the range of from 2 to 14, with

(ii) trimellitic acid or trimellitic anhydride in an amount of 1 to 4 moles of said trimellitic acid or trimellitic anhydride per one mole of said polyoxyalkylene ether, with

(2) a diepoxy compound in an amount of 0.1 to 0.5 mole of said diepoxy compound per one mole of said polycarboxylic acid (1) to effect a chain-extending reaction, and

(B) a polyepoxy compound.

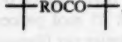
4,101,519

POLYCARBONATE EQUILIBRATION METHOD

John E. Hallgren, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,793
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—197 **8 Claims**

1. A method for reducng the molecular weight of aromatic polycarbonate consisting essentially of chemically combined units of the formula,



which comprises,

(A) agitating a mixture of the polycarbonate, a phenol of the formula,

QOH,

a substantially inert organic solvent and an effective amount of a tertiary amine catalyst,

(B) effecting the separation of polycarbonate from the mixture of (A) and

(C) recovering the polycarbonate from the mixture of (B), where Q is selected from R^1—, HOR— and ZR^2—, R is a $C_{(6-30)}$ divalent aromatic organic radical, R^1 is a $C_{(6-13)}$ monovalent aromatic organic radical, R^2 is a $C_{(6-13)}$ divalent aromatic organic radical, and Z is a monovalent radical selected from carboxy, a $C_{(2-8)}$ olefinic hydrocarbon radical and an MSO_3 radical, where M is an alkali metal, halogen, phosphate, or amino.

4,101,520

METHYLATED, METHYLOLATED MELAMINE COMPOSITION

Leslie Boldizar, Wallingford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 19, 1976, Ser. No. 706,344
Int. Cl.[2] C08G *9/24*
U.S. Cl. 528—248 **1 Claim**

1. A methylated, methylolated melamine composition having a combined formaldehyde content of about 4.0 to 4.2 moles per mole of melamine; a combined methanol content in the form of methoxymethyl groups of about 3.7 to 3.8 moles per mole of melamine; an —NH content of about 1.1 to 1.25 moles per mole of melamine and a content of free methylol groups of about 0.12–0.4 mole per mole of melamine.

4,101,521

PROCESS FOR THE MANUFACTURE OF HIGHLY DISPERSE SOLIDS CONSISTING OF CROSSLINKED UREA-FORMALDEHYDE POLYCONDENSATION PRODUCTS

Alfred Renner, Muenchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 609,144, Aug. 29, 1975, Pat. No. 4,018,741, which is a continuation of Ser. No. 439,243, Feb. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 378,898, Jul. 13, 1973, abandoned, which is a continuation of Ser. No. 299,479, Oct. 20, 1972, abandoned, which is a continuation of Ser. No. 65,330, Aug. 19, 1970, abandoned. This application Jun. 3, 1976, Ser. No. 692,580
Claims priority, application Switzerland, Sep. 12, 1969, 13829/69
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.[2] C08G *2/28*
U.S. Cl. 528—242 **8 Claims**

1. A process for the manufacture of highly disperse insoluble and infusible solids of crosslinked urea-formaldehyde polycondensation products consisting of primary particles having an average diameter of not greater than 1 micron which consists essentially of

(A) forming an aqueous solution consisting essentially of water and a precondensate of urea and formaldehyde

(B) mixing said aqueous solution with a sufficient amount of sulphamic acid to achieve gel formation at a temperature of from 30° to 70° C to form a crosslinked gel, the molar ratio of formaldehyde to urea being from greater than 1.2 to 2.0 not later than at the time of gel formation, and

(C) comminuting drying and deagglomerating the resulting gel.

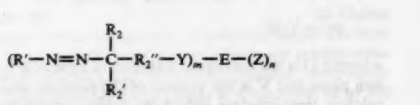
4,101,522

AZO COMPOUNDS CONTAINING ACYLATING FUNCTION AND AZO CONTAINING POLYMERS

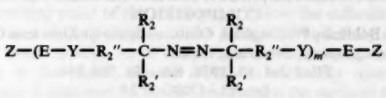
Chester Stephen Sheppard, Tonawanda, and Ronald Edward MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 471,115, May 17, 1974, abandoned, which is a division of Ser. No. 386,661, Aug. 8, 1973, Pat. No. 3,890,294, which is a division of Ser. No. 37,311, May 14, 1970, Pat. No. 3,752,802, which is a continuation-in-part of Ser. No. 667,352, Sep. 3, 1967, abandoned. This application Feb. 25, 1976, Ser. No. 661,458
Int. Cl.[2] C08G *63/68*
U.S. Cl. 528—292 **10 Claims**

1. A polymer having the formula:



or

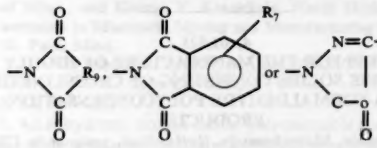


wherein:

(a) R' is t-aliphatic having 4-10 carbon atoms;

(b) R_2 is lower alkyl of 1 to 8 carbons;

(c) R'_2 is —CN, —C(=O)OR_6, —OC(=O)R_6, —CL, —Br, —OC(=O)H, —GC(=G)R_5, —GC(=G)GR_5, —GR_5, —N_3, —SCN, —NCS, —OCN, —OOR_8, —R_5,



(d) R_2'' is aliphatic of 1 to 10 carbons, aromatic of 6 to 12 carbons, aromatic-aliphatic of 7 to 20 carbons, or cycloaliphatic of 3 to 10 carbons;

(e) R_2 and R_2'', when taken together with the tertiary carbon atom connected to the azo nitrogen atom, form a cycloaliphatic triradical of 3-10 carbons.

(f) Y is a divalent radical selected from —C(=O)O—, —OC(=O)O—, and, —OC(=O)R_3(COOH)C(=O)O—,

(g) R_3 is an aromatic of 6 to 12 carbons, aliphatic of 1 to 10 carbons, or cycloaliphatic of 3 to 10 carbons;

(h) R_5 is an alkyl or cycloalkyl radical of 1–12 carbons or an aromatic radical of 6–12 carbons;

(i) R_6 is alkyl of 1 to 6 carbons;

(j) R_7 is H, alkyl or cycloalkyl of 1–10 carbons, or aromatic of 6–12 carbons;

(k) R_8 is tertiary aliphatic of 4 to 10 carbons;

(l) R_9 is lower alkylene of 1 to 6 carbons;

(m) G is oxygen or sulfur;

(n) E is a divalent residue of a polyester;

(o) m is 1 to 2; n is 0 to 1 and m plus n is 2;

(p) m' is 1 to 100; and

(q) Z is selected from -OH, and —H.

4,101,523

POLYESTER FILMS

Masamichi Watanabe, Yokohama; Takuo Nakahara; Seiji Sakamoto, both of Machida; Kunio Bizen, Yokohama; Akikazu Yano, Yokohama, and Yuzo Otani, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 16, 1976, Ser. No. 705,936

Claims priority, application Japan, Jul. 17, 1975, 50/87480; Jul. 18, 1975, 50/87937; Jul. 18, 1975, 50/87935

Int. Cl.² C08G *63/22*

U.S. Cl. 528—309 **2 Claims**

1. A polyester film comprising a polyester mainly consisting of polyethylene terephthalate and 0.02 to 0.4% by weight of calcium terephthalate anhydride particles incorporated into the polyester by addition to the reaction medium in which the polyester is formed, said calcium terephthalate anhydride particles having an average particle diameter of 0.2 to 4.5 microns and a volume shape factor, ϕv, in the range of 0.08 to 0.4, said ϕv being calculated by the formula:

$$\phi v = V/D^3$$

wherein D is the maximum diameter of a particle in the projection plane and V is the volume of the particle, said particulate calcium terephthalate anhydride being formed by reacting a dialkali metal terephthalate with a water-soluble calcium compound and heating the resultant calcium terephthalate to a temperature above 100° C to convert it into its anhydride.

4,101,524

METHOD FOR THE PRODUCTION OF COLORLESS POLYESTER AMIDES

Klaus Burzin, and Rainer Feldmann, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,358

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1975, 2542467

Int. Cl.² C08G *63/22, 63/68*

U.S. Cl. 528—288 **6 Claims**

1. A method for the production of colorless polyester amides from monomer starting materials selected from the group consisting of dicarboxylic acids, esters of dicarboxylic acids, primary diamines, polyhydric alcohols and aminocarboxylic acids; esters of dicarboxylic acids, primary diamines and aminocarboxylic acids; dicarboxylic acids, esters of dicarboxylic acids, primary diamines and lactams; esters of dicarboxylic acids, primary diamines and lactams; dicarboxylic acids, esters of dicarboxylic acids, primary diamines and aminocarboxylic acids; or esters of dicarboxylic acids, primary diamines, polyhydric alcohols and aminocarboxylic acids comprising:

(a) condensing said starting materials in a first condensing stage in the presence of about 3 to 20 percent by weight of added water based on the total weight of polyamide forming starting materials under a pressure of about 14 to 25 bar and at a temperature of about 220°–300° C:

(b) removing said water from said first condensing stage; and

(c) in a second condensing stage completely condensing said starting materials at a reduced pressure of about 0.91 to 100 mbar and at a temperature of about 230° to 300° C.

4,101,525

POLYESTER YARN OF HIGH STRENGTH POSSESSING AN UNUSUALLY STABLE INTERNAL STRUCTURE

Herbert L. Davis, Convent Station; Michael L. Jaffe, Summit, both of N.J.; Herman L. LaNieve, III, and Edward J. Powers, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,850

Int. Cl.² C08G *63/18, 63/70*

U.S. Cl. 528—309 **16 Claims**

1. An improved high performance polyester multifilament yarn comprising at least 85 mol percent polyethylene terephthalate and having a denier per filament of 1 to 20 exhibiting no substantial tendency to undergo self-crimping upon the application of heat which is particularly suited for use in industrial applications at elevated temperatures and which possesses an unusually stable internal structure as evidenced by the following novel combination of characteristics:

(a) a birefringence value of +0.160 to +0.189,

(b) a stability index value of 6 to 45 obtained by taking the reciprocal of the product resulting from multiplying the shrinkage at 175° C. in air measured in percent times the work loss at 150° C. when cycled between a stress of 0.6 gram per denier and 0.05 gram per denier measured at a constant strain rate of 0.5 inch per minute in inch-pounds on a 10 inch length of yarn normalized to that of a multifilament yarn of 1000 total denier, and

(c) a tensile index value greater than 825 measured at 25° C. obtained by multiplying the tenacity expressed in grams per denier times the initial modulus expressed in grams per denier.

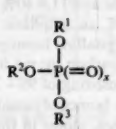
4,101,526
PROCESS FOR THE MANUFACTURE OF LINEAR POLYESTERS WHICH CONTAIN PHOSPHITES AND/OR PHOSPHATES

Lothar Buxbaum, Lindenfels, Odenwald, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,620
Claims priority, application Switzerland, Feb. 2, 1976, 1263/76
Int. Cl.[2] C08G *63/18, 63/68*
U.S. Cl. 528—179 20 Claims

1. An improved process for the manufacture of high molecular weight linear homo- or copolyesters, which contain moieties selected from the group consisting of phosphites and phosphates, and which are derived from aromatic and/or cycloaliphatic, unsaturated aliphatic and optionally in addition aliphatic, dicarboxylic acids, hydroxycarboxylic acids and diols, and which are formed first by transesterification process in the presence of a catalyst followed by a preliminary precondensation to give a precondensate containing hydroxy groups and with an average minimum degree of polycondensation Pn of 50, wherein the improvement comprises

adding from 1 to 25% by weight, based on the polyester precondensate, of a reaction catalyst of the general formula I, or mixtures thereof,



(I)

wherein R^1, R^2 and R^3 are the same or different, and represent linear or branched alkyl groups, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; or said aryl, aralkyl, cycloalkyl or cycloalkylalkyl groups substituted by alkyl, cyclohexyl, phenyl or phenylalkyl, and x is 0 or 1, and

completing the polycondensation in the melt or solid phase at a temperature between 170° C and 320° C until a minimum degree of polymerisation Pn of 100 is attained.

20. A polyester composition prepared by the process according to claim 1.

4,101,527
MOISTURE CURING POLYMERS PREPARED FROM POLYFUNCTIONAL ISOCYANATES AND A DIOXAZABICYCLO OCTANE

Arthur L. Cunningham, Park Forest, and John Mathai, Chicago, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Feb. 18, 1977, Ser. No. 770,245
Int. Cl.[2] C08G *18/00*
U.S. Cl. 528—73 10 Claims

1. A composition polymerizable to a cured film in the presence of moisture which comprises a polyfunctional isocyanate and a dioxazabicyclooctane.

4,101,528
COPOLYESTERS OF ETHYLENE 2,6-NAPHTHALENE DICARBOXYLATE AND HALOGENATED COMONOMERS

William N. Knopka, Wilmington, Del., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Division of Ser. No. 385,572, Aug. 3, 1973, Pat. No. 3,874,573, and a continuation-in-part of Ser. No. 328,043, Jan. 30, 1973, Pat. No. 3,874,155, Ser. No. 328,044, Jan. 30, 1973, abandoned, Ser. No. 328,045, Jan. 30, 1973, Pat. No. 4,045,513. This application Jun. 16, 1977, Ser. No. 806,979
The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—45.75 R 9 Claims

1. A linear, filament-forming, random copolyester resin of at least 75 mol % of ethylene-2,6-naphthalene dicarboxylate units and at least 3 mol % up to 25 mol % of a copolymerized halogenated ester unit having bromine or chlorine chemically united with either the dicarboxylic acid residue of said ester unit or both the diacid residue and the diol residue of said ester unit in an amount sufficient to provide at least 3.5% of the halogen, based on the weight of the copolyester.

4,101,529
HARD, OPTICALLY CLEAR POLYURETHANE ARTICLES

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1976, Ser. No. 655,184
Int. Cl.[2] C08G *18/28*
U.S. Cl. 528—67 21 Claims

1. A polyurethane composition substantially free of ether linkages characterized by being heat curable to yield hard, impact-resistant articles having a Shore D hardness at room temperature of at least 75, said articles having a heat distortion temperature as determined according to ASTM D-648 of at least 190° F. (88° C.) and showing no visual change when exposed to ultraviolet light in accordance with ASTM G-25-70, Method A, comprising the reaction product of:

(A) a cycloaliphatic polyisocyanate,

(B) a low molecular weight active hydrogen-containing material containing only two active hydrogens per molecule,

(C) a low molecular weight active hydrogen-containing material having at least three active hydrogens per molecule, and optionally,

(D) a polymeric polycarbonate diol; the equivalent ratio of (B)/(C) being within the range of 0.5 to 10/1, said reaction product having a calculated weight percentage of urethane linkages of at least 20 percent, a calculated molecular weight between branch points of 600–4,000 and the percentage by weight of cycloaliphatic structural units being within the range of 45 to 50.

4,101,530
PROCESS FOR THE PRODUCTION OF POLYISOCYANATE MIXTURES CONTAINING BLOCKED ISOCYANATE GROUPS

Tilo Burkhardt, and Manfred Schönfelder, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 22, 1976, Ser. No. 734,832
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550156
Int. Cl.[2] C08G *18/81*
U.S. Cl. 528—45 23 Claims

1. A process for the production of polyisocyanate mixtures containing blocked isocyanate groups which are readily soluble in lacquer solvents, wherein polyhydroxyl compounds having a molecular weight in the range of from about 62 to 300 or mixtures of polyhydroxyl compounds having an average

molecular weight of from about 62 to 300 are reacted with 3-isocyanato methyl-3,5,5-trimethyl cyclohexyl isocyanate to form a reaction mixture containing urethane groups and free isocyanate groups, the quantitative ratios between the reactants being selected in such a way that the reaction mixture contains from about 2 to 12 isocyanate groups per hydroxyl group, and the free isocyanate groups in the reaction mixture are blocked by reaction with blocking agents containing isocyanate-reactive methylene groups,

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4,101,531

ANIONIC COPOLYMERIZATION OF 2-PYRROLIDONE WITH CAPROLACTAM OR PIPERIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 687,968, May 19, 1976, Ser. No. 724,801, Sep. 20, 1976, and Ser. No. 724,802, Sep. 20, 1976. This application Apr. 25, 1977, Ser. No. 790,776

Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—315 **25 Claims**

1. A process for the production of a solid copolymer of 2-pyrrolidone and a lactam having five or six carbon atoms in its ring, which comprises polymerizing a mixture of 2-pyrrolidone and said lactam by contacting the mixture with a catalyst system consisting essentially of an alkaline polymerization catalyst, and an auxiliary catalyst which is a quaternary Group VA onium salt, carbon dioxide and a copolymerization promoter.

4,101,532

PROCESS FOR THE PRODUCTION OF HIGH VISCOSITY POLYAMIDE BY ADDING ALKYLENE CARBONATE TO MOLTEN POLYAMIDE

Vincenzo Ruoti, Varese, and Felice Farioli, Fagnano Olona, both of Italy, assignors to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed Jan. 10, 1977, Ser. No. 757,934

Claims priority, application Italy, Jan. 22, 1976, 19471 A/76

Int. Cl.[2] C08G *69/48*

U.S. Cl. 528—311 **6 Claims**

1. Process for the production of polyamide composition having a high viscosity in the molten state which comprises preparing an original polyamide, adding to said polyamide in the molten state an alkylene carbonate in an amount from 0.1 to 2% by weight of the polyamide, and extruding the resulting alkylene carbonate containing polyamide composition, thereafter subjecting said composition to heat treatment under a vacuum at residual pressure below 5 mmHg, at a temperature between about 110° C and 210° C, whereupon the relative viscosity of said composition is markedly raised relative to the original and extruded polyamide.

4,101,533

CYCLIC CARBONIC ACID ESTERS AS SOLVENTS FOR POLY-(β-HYDROXYBUTYRIC ACID

Robert M. Lafferty, and Elmar Heinzle, both of Graz, Austria, assignors to Agroferm AG, Chur, Switzerland

Filed Jan. 12, 1977, Ser. No. 758,647

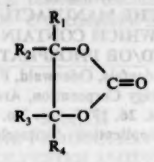
Claims priority, application Switzerland, Jan. 14, 1976, 403/76

Int. Cl.[2] C08G *63/06*

U.S. Cl. 528—491 **14 Claims**

1. A process for the extraction of racemic or optically active poly-(β-hydroxybutyric acid) from a fermentaton mass which comprises:

contacting a fermentation mass containing poly-(β-hydroxybutyric acid) with a liquid cyclic carbonic acid ester of the formula:



wherein R_1, R_2, R_3 and R_4, which are the same or different, are hydrogen or alkyl with 1 to 6 carbon atoms, as a solvent for the poly-(β-hydroxybutyric acid.

4,101,534

METAL-BONDING ADHESIVE COMPOSITIONS

Hiroshi Ueno, Kawasaki; Shinya Otsuka, Tokyo; Tetsuo Tsukamoto, Tokyo, and Akira Kishimoto, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Limited, Japan

Filed Jul. 13, 1972, Ser. No. 271,409

Claims priority, application Japan, Aug. 4, 1971, 46-58362

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 TW **16 Claims**

1. A metal-bonding adhesive composition consisting essentially of 89 - 60% by weight, based on the total composition, of an aliphatic homopolyamide and 11 - 40% by weight, based on the total composition, of an aliphatic copolyamide, said homopolyamide being a crystalline homopolyamide having 7 - 13 amide groups per 100 carbon atoms in the polymer backbone, said copolyamide consisting of 90 - 70% by weight of (i) recurring units such that a homopolyamide thereof has 7 - 13 amide groups per 100 carbon atoms in the polymer backbone and (ii) 10 - 30% by weight of (ii) recurring units which are different from the recurring units (i), and said copolyamide being the same as the recurring units of said crystalline homopolyamide.

16. A polyamide powder composition comprising,

A. 60 - 89 percent by weight, based on the total composition, of an aliphatic homopolyamide and

B. about 40 - 11 percent by weight, based on the weight of the total composition, of an aliphatic copolyamide, said homopolyamide having 7 - 13 amide groups per hundred carbon atoms in the polymer backbone, said copolyamide consisting of 70 - 90% by weight of

(i) recurring units having 7 - 13 amide groups per 100 carbon atoms in the polymer backbone, wherein said recurring units are the same as the recurring units of said homopolyamide and 30 - 10% by weight of (ii) recurring units which are different from the recurring units in (i).

4,101,535

METHOD AND APPARATUS FOR RECOVERING SAPONIFIED TALL OIL

Jerry Zucker, Lake Como, Fla., assignor to Hudson Pulp & Paper Corp., New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,836

Int. Cl.[2] C09F *1/00*

U.S. Cl. 260—97.7 **8 Claims**

1. The method of removing tall oil soap from black liquor in a storage pond, which method comprises, the steps of, storing the liquor with its surface exposed to the atmosphere for a sufficient period of time to permit particles of soap and lignin in said black liquor to accumulate in a layer at the bottom of the pond, creating a whipping action in the black liquor and disturbing said layer on the bottom of the pond with said whipping action to cause the particles of soap in said layer to agglomerate and release said lignin and also to agglomerate residual soap contained within the liquor above said layer, whereby the differences in specific gravity causes the agglomerated soap to float toward the top of the body of liquor in the

pond, and thereafter skimming the agglomerated soap from the surface of the black liquor in the pond.

4,101,536

MURAMYLDIPEPTIDE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Yuichi Yamamura, Hyogo; Tetsuo Shiba, Osaka; Ichiro Azuma, Osaka; Shoichi Kusumoto, Osaka; Tadamasa Hirayama, Tokyo, and Tsuneo Kusama, Tokyo, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

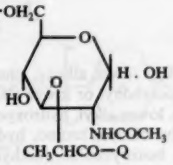
Filed Jun. 23, 1977, Ser. No. 809,245

Claims priority, application Japan, Jun. 23, 1976, 51-74072; Dec. 16, 1976, 51-150328; Feb. 3, 1977, 52-11122

Int. Cl.[2] C07G *103/52, 7/00;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **9 Claims**

1. Muramyldipeptide derivatives represented by the general formula



wherein Y represents a mycoloyl group or a synthetic higher acyl group having a total carbon number of C_{30}–C_{90} and having at least a branched chain of long alkyl group on the α-position thereof; Q represents an -L-alanyl-D-isoglutamine group,

a -glycyl-D-isoglutamine group, or

an -L-seryl-D-isoglutamine group.

4,101,537

OCTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Ernest D. Nicolaides, and Francis John Tinney, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Apr. 7, 1977, Ser. No. 785,393

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 LH **11 Claims**

1. A octapeptide having the name N^{α}-t-butoxycarbonyl-L-tryptophyl-O-benzyl-L-seryl-O-benzyl-L-tyrosyl-D-phenylalanyl-L-leucyl-N^{G}-nitro-L-arginyl-L-prolylglycine methyl ester.

4,101,538

NONAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Alfred Campbell, Ann Arbor, Mich., assignor to Warner-Lambert, Morris Plains, N.J.

Filed Jun. 13, 1977, Ser. No. 805,764

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 LH **2 Claims**

1. A nonapeptide of the formula

benzyloxycarbonyl-Gln-Trp-Ser-Tyr-Trp-Pro-Pro-Tyr(benzyl)-Ser(benzyl)-Y

where Y is amino, lower alkylamino or di(lower alkyl)amino.

4,101,539

BACITRACIN RECOVERY PROCESS

James Alexander Kindraka, Terre Haute, Ind., and John Bernard Gallagher, Paris, Ill., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 17, 1977, Ser. No. 844,092

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 R **10 Claims**

1. A process for the recovery of bacitracin from a fermented beer containing it comprising the steps of:

a. screening the fermented beer through a 100–150 mesh screen,

b. adjusting the pH of the fermented beer to about 7.5 to about 8.7,

c. ultrafiltering the fermented beer in an ultrafilter having a molecular weight cut off of from 30,000 to 80,000, and

d. collecting and holding the bacitracin containing permeate at a temperature of less than 30° C.

4,101,540

3-TRIFLUOROMETHYL-4-PHENYL-PYRAZOLIUM AZO DYESTUFFS

Gerard Emile Edgard Coispeau, Soisy-sous-Montmorency, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

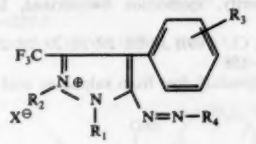
Filed Sep. 20, 1976, Ser. No. 724,488

Claims priority, application France, Sep. 30, 1975, 75 29873; Sep. 30, 1975, 75 29874

Int. Cl.[2] C09B *29/00, 29/36, 29/38;* **D06B** *3/76*

U.S. Cl. 260—147 **7 Claims**

1. A dyestuff of the formula:



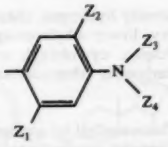
in which R_1 is alkyl containing 1 to 4 carbon atoms, phenyl, chlorophenyl, bromophenyl, nitrophenyl, alkoxy (C_1–C_2)-phenyl or alkyl (C_1–C_4)-phenyl;

R_2 is alkyl containing 1 to 4 carbon atoms;

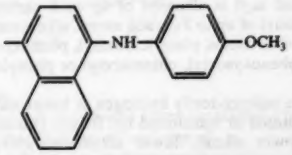
R_3 is hydrogen, chlorine or bromine;

R_4 is a radical of the formula:

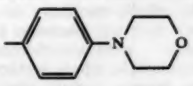
(a)



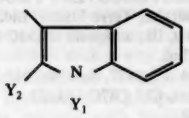
(b)



(c)

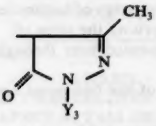


(d)



or

(e)



Y_1 is hydrogen, methyl, ethyl, cyanoethyl or 2-hydroxypropyl;

Y_2 is hydrogen, methyl, isopropyl or phenyl;

Y_3 is hydrogen, phenyl, tolyl, nitrophenyl, chlorophenyl or methoxyphenyl;

Z_1 is hydrogen, chlorine, methyl, methoxy, ethoxy or acetylamino;

Z_2 is hydrogen, methyl or ethoxy;

Z_3 is methyl or ethyl;

Z_4 is methyl, ethyl, cyanoethyl, trifluoroethyl, diethylaminoethyl, succinimidoethyl or phenyl; and

$X^{\ominus}$ is a monovalent anion.

4,101,541

3-CYANO-1,2,4-THIADIAZOLYL-5-CZO DYESTUFFS

Jean Claude Petitpierre, Kaiseraugst, and Visvanathan Ramanathan, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

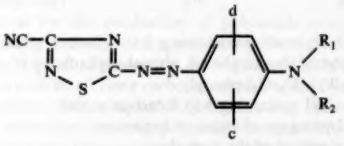
Continuation of Ser. No. 532,331, Dec. 12, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,067

Claims priority, application Switzerland, Dec. 21, 1973, 18040/73

Int. Cl.[2] C09B *29/06, 29/10, 29/24, 29/38*

U.S. Cl. 260—158 **5 Claims**

1. An azo dyestuff, free from sulphonic acid groups, of the formula



wherein

d and *c* are independently hydrogen, chloro, bromo, lower alkyl, lower alkoxy, lower alkylmercapto, phenyl, phenoxy, phenylmercapto, cyclohexyl, cyclohexylmethyl, benzyl, methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl;

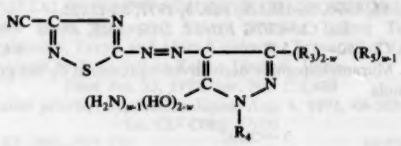
and

c is additionally trifluoromethyl or acylamino wherein the amino group is otherwise unsubstituted or substituted by methyl, and acyl is alkanoyl of up to 5 carbon atoms, alkylcarbamyl of up to 5 carbon atoms, alkoxycarbonyl of up to 5 carbon atoms, phenylcarbamyl, phenoxycarbonyl, benzoyl, phenoxyacetyl, chloroacetyl or phenylacetyl;

and

R_1 and R_2 are independently hydrogen or lower alkyl which is unsubstituted or substituted by: fluoro, chloro, bromo, phenyl, lower alkoxy, lower alkylcarbonyloxy, lower alkylcarbonylamino, benzoyloxy, benzoylamino (chloro-, bromo-, methyl-, ethyl-, methoxy- or ethoxy-) benzoylamino, cyano, hydroxy, phenoxy, phenylcarbonyl, phenylsulphonyloxy, phenoxycarbonyl, phenylthio, (chloro-, bromo-, methyl-, ethyl-, methoxy- or ethoxy) phenoxy, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenylcarbonyl, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenylsulphonyloxy, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenoxycarbonyl, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenylthio, lower alkylsulphonyl, lower alkoxycarbonyloxy, phenoxycarbonyloxy, phenylaminocarbonyloxy, aminocarbonyl, mono-lower alkylaminocarbonyl di-lower alkylaminocarbonyl, lower alkylcarbonyl, succinimido, phthalimido, lower alkoxycarbonyl cinnamoyl, thiophenecarbonyl, pyridinecarbonyl, phenoxyalkylcarbonyloxy, phenylaminoalkylcarbonyloxy or (lower alkoxy- or phenoxy-) carbonylalkylcarbonyl (-oxy or -amino).

3. An azo dyestuff, free from sulfonic acid groups, of the formula



wherein

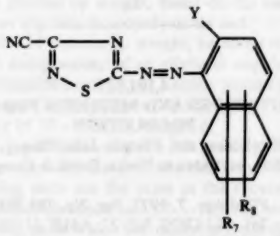
R_3 is lower alkyl, lower alkoxy, phenyl, lower alkoxycarbonyl, aminocarbonyl or lower alkyl aminocarbonyl;

R_4 is hydrogen, lower alkyl, hydroxyethyl, phenyl or phenyl substituted by chloro, bromo, hydroxy, lower alkylcarbonylamino, benzoylamino, methyl, ethyl, propyl or butyl, or is sulpholanyl;

R_5 is hydrogen, lower alkyl, lower alkoxy, cyano, lower alkoxycarbonyl, carbamoyl, loweralkoxy-loweralkoxycarbonyl, phenoxy or phenyl; and

w is 1 or 2.

4. An azo dyestuff, free from sulfonic acid groups of the formula



wherein

Y is —OH or —NHR_6,

R_6 is hydrogen, lower alkyl, benzyl or phenylethyl; and

R_7 and R_8 independently are hydrogen, halo, lower alkyl, lower alkoxy, nitro, sulphonylamino, N-lower alkyl sulphonylamino or N,N-dilower alkylsulphonylamino.

4,101,542

PROCESS FOR THE SELECTIVE DESTRUCTION, BY REDUCTION, OF P-COUPLED PRODUCTS OF THE 1-NAPHTHOL SERIES

Erich Krämer, Bergisch-Gladbach, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1976, Ser. No. 745,400

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553443; Oct. 1, 1976, 2644433

Int. Cl.[2] C09B *29/00, 41/00, 46/00*

U.S. Cl. 260—158 **4 Claims**

1. Process for the selective destruction of p-coupled product of a 1-naphthol coupler and a diazo compound in the presence of o-coupled products thereof which comprises treating said

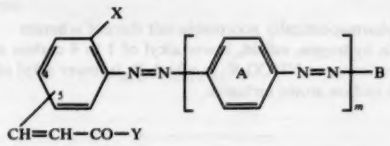
coupled products with hydrazine, hydrazine and a redox catalyst, a salt of dithionous acid or a salt of hydroxymethanesulphinic acid at a pH > 4 and a temperature of 10°–100° C to reduce said p-coupled product, and then separating the o-coupled products.

4,101,543
BENZENE-AZO-HETEROCYCLIC DYESTUFFS DERIVED FROM ALKYL AMINOCINNAMATES OR AMINOCINNAMIDE

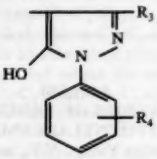
Jean-Pierre Henri Stiot, Saint Pierre les Elbeuf; Claude Marie Henri Emile Brouard, Sotteville les Rouen, and Jean Marie Louis Leroy, Saint Etienne du Rouvray, all of, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 12, 1974, Ser. No. 441,791
Claims priority, application France, Feb. 16, 1973, 73.05503
Int. Cl.[2] C09B *29/36, 29/38, 31/14, 33/02*
U.S. Cl. 260—162 **8 Claims**

1. A dyestuff of the formula:



in which -CO═CH-CO-Y is fixed in the 4 or 5 position, X is hydrogen or chlorine, Y is amino or alkoxy containing 1 to 4 carbon atoms, the p-phenylene nucleus A is unsubstituted or substituted by chlorine, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, formylamino, acetylamino, propanoylamino, benzoylamino or cinnamoylamino, m is zero or one, and B represents the radical N-methyl (or ethyl)-4-hydroxy-2-oxo-quinolyl, 2-hydroxy-carbazolyl, 3-hydroxy-dibenzofuranyl, 2-phenyl-indolyl, N-methyl (or ethyl)-2-hydroxy-3-cyano-4-methyl-6-oxo-pyridyl, 3,6-dimethyl-4-hydroxy-1-phenyl-(4,5-b)pyrazolopyridyl or the radical of formula:



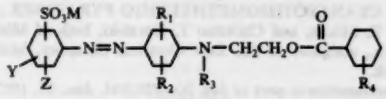
wherein R_3 is hydrogen, methyl, alkoxycarbonyl, carbonamido or alkyl-substituted carbonamido and R_4 is hydrogen, chlorine, nitro, methyl, cyano or, but only in the 3 or 4 position of the phenyl nucleus, sulphonamido, carbonamido, alkyl-substituted sulphonamido or alkyl-substituted carbonamido, the alkyl and alkoxy groups of R_3 and R_4 containing 1 to 4 carbon atoms.

4,101,544
WATER SOLUBLE MONOAZO DYES FOR POLYAMIDE MATERIAL

Allan M. Huffman, Lock Haven; Paul R. Horinka, West Lawn, and Dominic A. Zanella, Lock Haven, all of Pa., assignors to American Color & Chemical Corporation, Charlotte, N.C.

Filed Sep. 26, 1975, Ser. No. 617,149
Int. Cl.[2] C09B *29/08, 29/26*
U.S. Cl. 260—207.1 **3 Claims**

1. A dye of the formula:



wherein:

(a) M is hydrogen or a member selected from the group consisting of alkali metal ions, the ammonium ion and hydroxylalkyl ammonium ions, the alkyl portion of which has from 3 to 12 carbon atoms;

(b) Y and Z are members independently selected from the group consisting of hydrogen, chlorine, bromine and lower alkyl;

(c) R_1 and R_2 are members independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine and bromine;

(d) R_3 is a member selected from the group consisting of lower alkyl and lower alkyl cyano; and

(e) R_4 is a member selected from the group consisting of hydrogen, chlorine, bromine and lower alkyl.

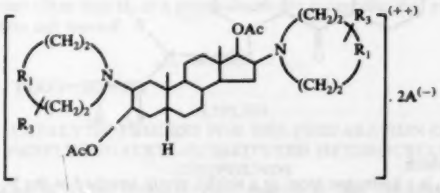
4,101,545
DIAMINO-ANDROSTANES AND A PROCESS FOR THE PREPARATION OF THE SAID COMPOUNDS

Zoltan Tuba; Maria Marsai; Katalin Biro; Laszlo Szporny; Egon Karpati, and Szaboles Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 28, 1976, Ser. No. 709,325
Claims priority, application Hungary, Aug. 1, 1975, RI 575
Int. Cl.[2] C07J *43/00*
U.S. Cl. 260—239.5 **4 Claims**

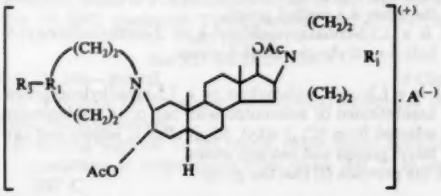
1. A compound of the formulae

(1a)



or

(1b)



wherein

Ac is an alkyl carbonyl group containing 1 to 4 carbon atoms in the alkyl moiety and one of

R_1 and R_1' is a methylene group and the other is a group of the formula >N-R_2 wherein R_2 is an alkyl group containing 1 to 3 carbon atoms,

A is halogen and

R_3 is an alkyl group containing 1 to 4 carbon atoms, or an allyl group

4,101,546

CYANATOTHIOMETHYLTHIO PYRAZINES

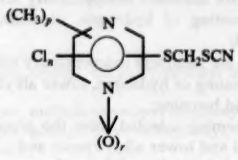
Craig E. Mixan, and Christian T. Goralski, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 759,944, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 588,757, Jun. 29, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,473

Int. Cl.[2] C07D *241/04*

U.S. Cl. 544—408 **14 Claims**

1. A compound corresponding to the formula



wherein *n* represents an integer of 0 to 3, *p* represents an integer of 0 to 2 and the sum of $n + p$ is an integer of 0 to 3; and *r* is 0 or 1.

4,101,547

1,4-DIAMINOANTHRAQUINONES

Roland Mislin, Saint-Louis, France; Wolfgang Schoenauer, Riehen, and Karl Ulrich Steiner, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

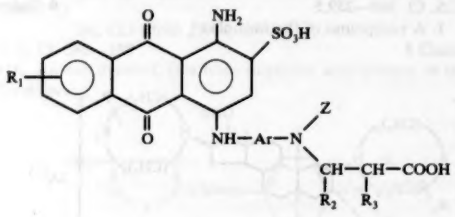
Filed Jun. 25, 1976, Ser. No. 700,064

Claims priority, application Switzerland, Jul. 2, 1975, 8596/75

Int. Cl.[2] C09B *62/20, 62/28, 1/22*

U.S. Cl. 544—294 **11 Claims**

1. A compound of formula



in which

R_1 is a hydrogen atom or a sulpho group attached at the 5-, 6-, 7- or 8-position of the anthraquinone nucleus,

each of

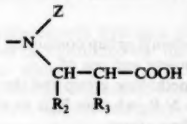
R_2 and R_3 is a hydrogen atom or one is a hydrogen atom and the other is a methyl group,

Z is a 2,5,6-trihalopyrimidinyl-4 or 2-methylsulphonyl-5-halo-6-methylpyrimidinyl-4 group,

and

Ar is a 1,3- or 1,4-phenylene or a 1,5-naphthylene group, unsubstituted or substituted with one or two substituents selected from (C_{1-4}) alkyl, (C_{1-4}) alkoxy, sulpho and carboxyl groups and halogen atoms,

with the provisos (i) that the group



is not attached at an adjacent position on the phenylene or naphthylene nucleus to any sulpho substituent on that nucleus, and (ii) two sulpho or two carboxyl groups, or one sulpho and one carboxyl group cannot simultaneously be present on the phenylene nucleus, or a water soluble salt thereof.

4,101,548

1,2,3-THIADIAZOLE AMIDES

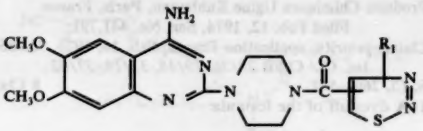
Ronnie R. Crenshaw, Dewitt, and Richard A. Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,966

Int. Cl.[2] C07D *239/84*

U.S. Cl. 544—284 **6 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein

R_1 is hydrogen, amino, lower alkyl of 1 to 4 carbon atoms inclusive or $NHCO_2R_2$ in which R_2 is lower alkyl of 1 to 4 carbon atoms inclusive.

4,101,549

AMINOPHENYL ESTERS OF 5-CARBOXYALKYL BARBITURIC ACIDS

Antonino Focella, Clifton; John Edward Heveran, Fairfield; Sidney Teitel, Clifton, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 26, 1976, Ser. No. 690,123

Int. Cl.[2] C07D *239/62*

U.S. Cl. 544—301 **3 Claims**

1. A primary aminophenyl ester of a 5-lower alkyl of 2 to 8 carbon atoms -5-(1-carboxy-lower alkyl of 2 to 8 carbon atoms) barbituric acid.

4,101,550

BIS-PIPERAZIDES OF TRISUBSTITUTED HYDROXYPHENYLALKANOIC ACIDS

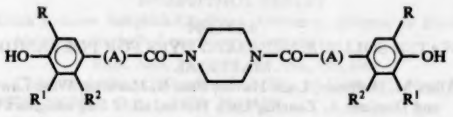
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 682,237, May 3, 1976, Pat. No. 4,049,713, which is a division of Ser. No. 490,835, Jul. 23, 1974, Pat. No. 3,984,460, which is a continuation-in-part of Ser. No. 400,745, Sep. 25, 1973, abandoned. This application Apr. 22, 1977, Ser. No. 789,897

Int. Cl.[2] C07D *295/18*

U.S. Cl. 544—387 **4 Claims**

1. A compound having the formula



wherein

R is branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms, and

A is straight chain alkylene of 1 to 3 carbon atoms.

4,101,551
QUINOPHTHALONE DYESTUFFS

Manfred Groll, Cologne, Fed. Rep. of Germany, and Hans-Samuel Bien, deceased, late of Burscheid, Fed. Rep. of Germany (by Else Bien, administrator), assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

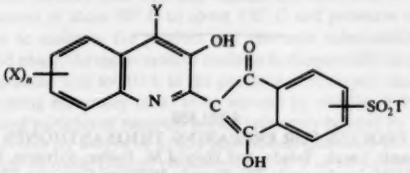
Filed Jul. 2, 1976, Ser. No. 702,045

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1975, 2530123; Jul. 5, 1975, 2530124

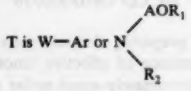
Int. Cl.[2] C07D *215/22;* C09B *25/00*

U.S. Cl. 260—283 SA **9 Claims**

1. Water-insoluble quinophthalone dyestuff of the formula



wherein



Ar is phenyl, naphthyl, mono-, di-, or tri-substituted phenyl, or mono-, di- or tri-substituted naphthyl where the substituents are chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, phenyl, phenoxy, cyano, nitro, methylmercapto, methoxycarbonyl, or hydroxy;

W is oxygen, sulfur, or

R is hydrogen, C_1-C_4-alkyl, or C_1-C_4-alkyl substituted by cyano, hydroxy, methoxy, or chloro;

A is straight-chain or branched-chain C_2-C_6-alkylene or C_2-C_6-alkylene interrupted in its chain by oxygen;

R_1 is C_1-C_4-alkyl, cyano-C_1-C_4-alkyl, hydroxy-C_1-C_4-alkyl, methoxy-C_1-C_4-alkyl, chloro-C_1-C_4-alkyl, phenyl, naphthyl, mono-, di-, or tri-substituted phenyl, or mono-, di-, or tri-substituted naphthyl where the substituents are chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, phenyl, phenoxy, cyano, nitro, methylmercapto, methoxycarbonyl, or hydroxy;

R_2 is hydrogen, C_1-C_4-alkyl or C_1-C_4 -alkyl substituted by cyano, hydroxy, methoxy, or chloro;

X is chlorine, bromine, C_1-C_4-alkyl, methoxy-C_1-C_4-alkyl, chloro-C_1-C_4 alkyl, C_1-C_4-alkoxy, nitro, or C_1-C_4-alkylcarbonylamino;

Y is halogen, chlorine, or bromine; and

n is a number from 0 to 3.

4,101,552
NOVEL LYSERGIC ACID AMIDES AND PROCESS FOR PREPARING SAME

Erzsébet Magó née Karácsony; József Borsi; László Tardos; Ildikó Király; Sandor Elek, and István Elekes, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Apr. 23, 1976, Ser. No. 679,866

Claims priority, application Hungary, Apr. 24, 1975, GO 1309

Int. Cl.[2] C07D *457/06;* A61K *31/48*

U.S. Cl. 260—285.5 **2 Claims**

1. 9,10-dihydrolysergic acid-(3'-/pyrrolid-2''-on-1'-yl/-propyl)-amide.

2. 1-methyl-9,10-dihydrolysergic acid-(thiazoline-2'-yl)-amide.

4,101,553
IMIDAZO[2,1-a]ISOQUINOLINES

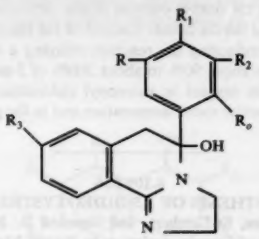
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 429,526, Jan. 2, 1974, abandoned. This application Nov. 4, 1974, Ser. No. 520,537

Int. Cl.[2] C07D *471/04;* A61K *31/47*

U.S. Cl. 260—288 CF **16 Claims**

1. A compound of the formula



where

R_0 represents H or halo of atomic weight 19–36,

each of R, R_1 and R_2 represents, independently, H, halo having an atomic weight of 19-36, methyl, methoxy, trifluoromethyl, or

R and R_1 or R_1 and R_2 taken together represent methylenedioxy, R_2 and R_0 and R and R_0 respectively then being H, and

R_3 represents H, halo having an atomic weight of 19–36, or methyl,

provided that (1) when R or R_2 is trifluoromethyl, R_1 is H or said halo, and (2) no more than two of R, R_1, R_2 and R_0 represent other than H, or a pharmaceutically acceptable acid addition salt thereof.

4,101,554
CATALYTIC PROCESS FOR THE PREPARATION OF PERFLUOROALKYL-SUBSTITUTED HETEROCYCLIC COMPOUNDS

John H. Tobin, Winsted, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 643,227, Dec. 22, 1975, Pat. No. 4,038,331, which is a continuation-in-part of Ser. No. 549,589, Feb. 13, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,362

Int. Cl.[2] C07D *213/26*

U.S. Cl. 260—290 HL **9 Claims**

1. A process for preparing perfluoroalkylsubstituted pyridines which comprises

a. heating together in the vapor phase under anhydrous conditions at temperatures from about 300° C to about 800° C

(1) a pyridine compound containing at least one hydrogen atom attached to a ring carbon atom and further substituted with from 0 to about 3 inert substituents;

(2) a perfluoroalkyl bromide having from about 1 to about 4 carbon atoms; and

(3) a catalytic amount of a catalyst selected from the group consisting of iodine and an iodine generating compound selected from the group consisting of perhaloalkyl iodine having 1 to 4 carbon atoms, IBr, and ICl.

4,101,555

PROCESS FOR INCREASING THE CIS CONTENT OF A MIXTURE OF CIS AND TRANS ISOMERS OF S-ISOPROPYL-1-(5-ETHYL-2-METHYL-PIPERIDINECARBOTHIOATE)

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 617,908, Sep. 29, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,501

Int. Cl.[2] C07D *211/32*

U.S. Cl. 260—293.85 **2 Claims**

1. In a process for the production of S-isopropyl-1-(5-ethyl-2-methylpiperidine carbothioate) by reaction of isomeric mixtures of cis- and trans-2-methyl-5-ethylpiperidinedine with isopropyl chlorothiolformate, the improvement comprising increasing the cis isomer content of the carbothioate product with respect to the cis isomer content of the starting piperidine comprising conducting the reaction utilizing a stoichiometric excess of from about 50% to about 300% of 2-methyl-5-ethyl-piperidine with respect to isopropyl chlorothiolformate at a temperature below room temperature and in the presence of an inert diluent.

4,101,556

TOTAL SYNTHESIS OF 2,5-DIDEOXYSTREPTAMINES

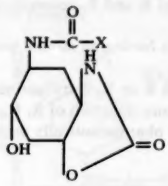
Gerry Kavadias, St-Lambert, and Bernard R. Belleau, Westmount, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 634,396, Nov. 24, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,482

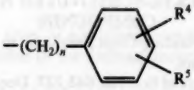
Int. Cl.[2] C07D *263/58*

U.S. Cl. 260—307 C **7 Claims**

1. The compound having the formula



in which X is —OR or R wherein R is (lower)alkyl, CF_3 or a group having the formula



in which n is an integer of 0 to 4 inclusive and R^4 and R^5 are alike or different and each is H, Cl, Br, I, F, (lower)alkyl, (lower)alkoxy or nitro; or an acid addition salt thereof.

4,101,557

SELECTIVE SYNTHESIS OF 2-HALOALKANETHIOLS AND EPISULFIDES THEREFROM

Wolfgang H. Mueller, Neuallschwil, Switzerland; Alexis A. Oswald, Mountainside, N.J., and Peter J. Kozak, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

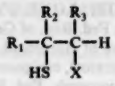
Continuation-in-part of Ser. No. 581,441, Sep. 23, 1966, Pat. No. 3,994,889. This application Apr. 27, 1970, Ser. No. 32,457

The portion of the term of this patent subsequent to Mar. 4, 1993, has been disclaimed.

Int. Cl.[2] C07D *331/02*

U.S. Cl. 260—327 E **10 Claims**

1. A process for preparing monomeric episulfides which comprises reacting a haloalkanethiol of the general formula



wherein R_1, R_2 and R_3 are hydrogen and C_1 to C_{20} nonsubstituted or monosubstituted monovalent hydrocarbon radicals and X is halogen, with a substantially equal molar amount of anhydrous ammonia at a temperature varying from about −50° to +50° and at a pressure of 0.5 to 3 atmospheres.

4,101,558

PROCESS FOR PREPARING THIOXANTHONES

Lubomir Vacek, Toledo, and Harold M. Foster, Sylvania, both of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Apr. 21, 1977, Ser. No. 789,465

Int. Cl.[2] C07D *335/16*

U.S. Cl. 260—328 **20 Claims**

1. A process of preparing thioxanthones which comprises reacting in the presence of effective amounts of a Friedel-Crafts catalyst approximately equal molar amounts of an ortho-chlorosulfenylbenzoyl chloride and at least one aromatic compound having the formula:

wherein R_1 and R_2 are either the same or different and selected from the class consisting of hydrogen, chlorine, bromine, hydroxyl, aryl, lower alkyl and lower alkoxy radicals having 1 to 8 carbon atoms.

4,101,559

PRECURSORS OF HETEROFURANOBENZOXEPIN ACETIC ACIDS

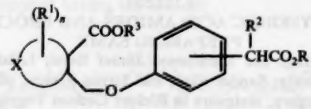
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,788

Int. Cl.[2] C07D *307/68*

U.S. Cl. 260—347.3 **4 Claims**

1. A compound of the formula



wherein X together with the carbon atoms to which it is attached is a furano ring structure; R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; R^3 is hydrogen or alkyl of 1 to 4 carbon atoms; n is the integer 0, 1 or 2; and salts thereof prepared from pharmaceutically acceptable bases.

4,101,560
SHAPED, BONDED BORIDE CATALYSTS

Ernest P. Buinicky, Newburgh; Joseph A. Durkin, Fishkill, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 656,048, Feb. 6, 1976, Pat. No. 4,033,901. This application Jan. 19, 1977, Ser. No. 760,779

Int. Cl.[2] C07D *301/20*

U.S. Cl. 260—348.29 **3 Claims**

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the steps of: reacting said olefin in a tubular reaction zone with said organic hydroperoxide at temperatures of about 90° C to about 130° C and pressures sufficient to maintain the product and reactants substantially in liquid phase; the molar ratio of olefin to hydroperoxide ranging from about 1:10 to 100:1; in the presence of a shaped catalyst consisting essentially of 80 to 95 percent by weight of finely divided particles of tungsten boride intimately bonded by 5 to 20 percent by weight of lightly preoxidized aluminum powder having an oxide coating constituting from 5 to 10 percent by volume of said powder, the molar ratios of hydroperoxide to catalyst ranging from about 1:1 to 10,000:1 and recovering the corresponding epoxy compound.

4,101,561
OXIDATIVE COUPLING OF ALKYLPHENOLS CATALYZED BY METAL COMPLEXES OF IMINO ACID COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

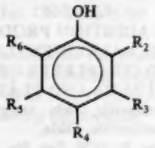
Filed Nov. 26, 1976, Ser. No. 745,209

The portion of the term of this patent subsequent to Nov. 14, 1994, has been disclaimed.

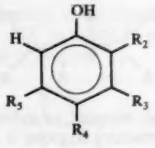
Int. Cl.[2] C07C *37/00, 39/12, 39/16, 45/16, 49/62, 49/72*

U.S. Cl. 260—396 N **12 Claims**

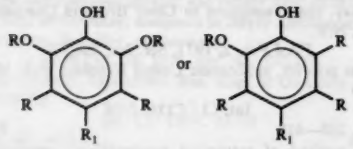
1. A method of preparing by an oxidation coupling reaction a carbon-carbon coupled condensation product of an alkyl phenol, an alkoxy phenol, or a 1-naphthol having one of the following formulas:



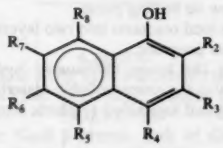
wherein R_2 and R_6 are alkyl, R_3 and R_5 are hydrogen or alkyl, and R_4 is hydrogen or methyl with the proviso that R_3 and R_5 cannot both be tertiary alkyl,



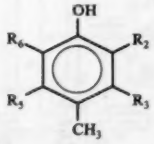
wherein R_2 and R_4 are alkyl provided that at least one of said alkyl groups is a tertiary alkyl and R_3 and R_5 are hydrogen or alkyl,



wherein each R is any alkyl group as defined above for the alkylphenols or OR, OR being alkoxy of 1–6 carbon atoms, and R_1 is either hydrogen or methyl, provided that the substituents adjacent to R_1 cannot both be tertiary alkyl or tertiary alkoxy,



wherein R_2, R_3 and R_4 are hydrogen, alkyl containing from 1 to 5 carbon atoms, or alkoxy containing from 1 to 6 carbon atoms, provided that either or both R_2 and R_4 are hydrogen and R_5, R_6, R_7, and R_8 are hydrogen, alkyl containing from 1 to 5 carbon atoms or alkoxy containing from 1 to 6 carbon atoms provided that tertiary alkyl or tertiary alkoxy groups may not be attached to adjacent carbon atoms of the naphthalene molecule,



wherein R_3 is hydrogen, a primary, secondary or tertiary alkyl or an alkoxy group, R_5 is a primary or secondary alkyl group containing from 1–5 carbon atoms and R_2 and R_6 are a primary, secondary or tertiary alkyl or an alkoxy group, said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of a catalyst system consisting essentially of an imino acetic acid metal complex wherein the metal source is selected from the class consisting of divalent copper, divalent nickel, divalent cobalt, divalent manganese, trivalent cerium, trivalent chromium, and trivalent iron and wherein the imino acid has the formula

$$R\text{-}N[(CH_2)_nCO_2H]_2$$

wherein *n* is 1 or 2 and R is hydrogen, alkyl, oxaalkyl, hydroxyalkyl, cycloalkyl, aryl, pyridyl or $—(CH_2)_nCO_2H$ wherein *n* is 1 or 2 and a sufficient amount of an alkaline material selected from the group consisting of alkali metal hydroxides, alkali metal carbonates and alkali metal bicarbonates to maintain the pH in the range of about 8.5–9.5 during the oxidative coupling reaction.

4,101,562
TREATMENT OF SAPONIFIED SYNTHETIC FATTY ACIDS

Ashok Kumar Bhandari, and Shrinath Sheshgiri Kalbag, both of Bombay, India, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 2, 1977, Ser. No. 764,970
Claims priority, application United Kingdom, Feb. 10, 1976, 5123/76
Int. Cl.² C11C *1/08*
U.S. Cl. 260—419 **7 Claims**

1. A method of extracting unsaponifiable material from saponified synthetic fatty acids by

(1) contacting an aqueous solution of the saponified synthetic fatty acids with a chlorinated hydrocarbon containing from 2 to 4 carbon atoms, said hydrocarbon being free of water miscible solvent and having a boiling point above about 70° C, in amounts of from about 10:1 to about 1:10 by weight, at a temperature above the normal boiling point of the chlorinated hydrocarbon to about 200° C and under a pressure sufficient to retain the chlorinated hydrocarbon below its boiling point;

(ii) settling the total reactants into two layers while retaining said sufficient pressure;

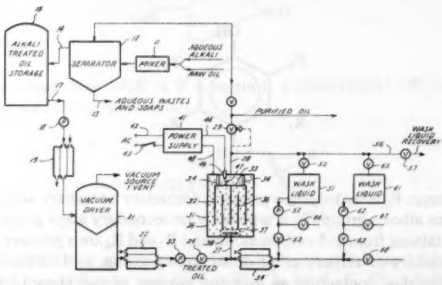
(iii) separating the lower chlorinated hydrocarbon layer which contains the unsaponifiable material; and

(iv) recovering said saponified synthetic fatty acids from the upper layer.

4,101,563
PROCESS FOR REFINING CRUDE OIL

Joel Victor Landis, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jan. 24, 1977, Ser. No. 761,753
Int. Cl.² C11B *3/06*
U.S. Cl. 260—425 **23 Claims**



1. A process for refining crude oil selected from the group consisting of fats and ahimal and vegetable oils, comprising the steps of:

(a) treating said crude oil with aqueous alkali to produce a treated oil with reduced acidic content but containing finely dispersed liquid-state alkali metal soaps and a bulk aqueous alkali phase;

(b) separating the bulk aqueous phase from the treated oil;

(c) subjecting the treated oil to electrofiltration by passing it through a bed of dielectric particulate solids having open but tortuous flow paths interposed within a d.c. electric field, whereby the finely dispersed alkali metal soaps adhere in their liquid state to the particulate solids in the bed and provide a purified oil with a substantially reduced solids content; and

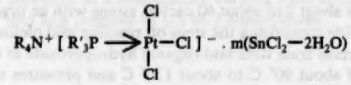
(d) withdrawing said purified oil.

4,101,564
PLATINUM-TIN HYDROFORMYLATION CATALYST

John E. Poist, High Bridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 794,781
Int. Cl.² C07C *7/22*; B01J *31/24, 31/18*; C07C *45/08*
U.S. Cl. 260—429.7 **5 Claims**

1. A platinum-tin hydroformylation catalyst corresponding to the formula:



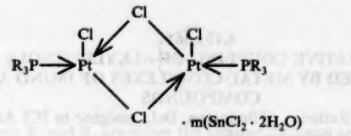
wherein R is a radical selected from hydrogen and alkyl and aryl groups containing between one and about 20 carbon atoms; R' is an organic radical selected from alkyl, alkoxy, aryl and aryloxy groups containing between one and about 20 carbon atoms; and *m* is an integer between one and about 10.

4,101,565
HYDROFORMYLATION CATALYST

John E. Poist, High Bridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 794,780
Int. Cl.² C07F *7/22*; B01J *31/24, 31/18*; C07C *45/08*
U.S. Cl. 260—429.7 **3 Claims**

1. A platinum dimer complex hydroformylation catalyst corresponding to the formula:



wherein R is an organic radical selected from alkyl, alkoxyl, aryl and aryloxy groups containing between one and about twenty carbon atoms; and *m* is an integer between two and about twenty.

2. A hydroformylation catalyst in accordance with claim 1 wherein the R radical is phenyl.

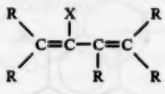
3. A hydroformylation catalyst in accordance with claim 1 wherein the R radical is butyl.

4,101,566
OXIDATIVE ADDITION PRODUCTION OF TRANS-HALO-2(1,3-ALKADIENYL)BIS(TRIETHYL-PHOSPHINE) COMPLEXES OF NICKEL(II), PALLADIUM(II), AND PLATINUM(II)

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,762
Int. Cl.² C07F *15/00, 15/04*
U.S. Cl. 260—439 R **15 Claims**

1. A process comprising contacting in solution a haloprene of the formula



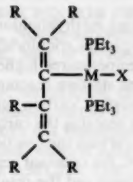
wherein X is chlorine, bromine, or iodine, four R groups are hydrogen and the remaining R group is hydrogen or methyl, and a zero valent complex having the formula

$M(PEt_3)_n$

wherein M is nickel, palladium, or platinum, PEt_3 represents triethylphosphine, *n* is 3 or 4, or

$$M(1,5\text{-COD})(PEt_3)_2$$

wherein M and PEt_3 are as defined above and 1,5-COD represents 1,5-cyclooctadiene, under conditions suitable for producing the corresponding trans-halo-2(1,3-alkadienyl)bis(triethylphosphine) metal(II) complex of the formula



wherein M, X, R, and PEt_3 are as defined above.

4,101,567

METHOD OF PREPARING CHROMIUM ALKANOATES

Colin Fitzmaurice, and Norman William Fletcher Webster, both of Clwyd, Wales, assignors to Graesser Salicylates Limited, Clwyd, Wales

Filed Feb. 9, 1977, Ser. No. 766,976

Claims priority, application United Kingdom, Feb. 13, 1976, 5812/76

Int. Cl.² C07F *11/00*

U.S. Cl. 260—438.5 R **7 Claims**

1. A method of preparing a chromic alkanoate having up to 6 carbon atoms which comprises heating an admixture of chromic anhydride, an alkanol having up to 6 carbon atoms, an alkanoic acid having up to 6 carbon atoms and water.

4,101,568

PRODUCTION OF DIALKYLALUMINUM HYDRIDES

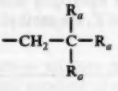
Dennis B. Malpass, LaPorte, Tex., and Spencer C. Watson, Wilmington, Del., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Feb. 27, 1976, Ser. No. 661,913

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 A **19 Claims**

1. A non-catalytic process for the production of dialkylaluminum hydrides having the formula R_2AlH in which R is an n-alkyl group having from 1 to 15 carbon atoms or a tri-substituted alkyl group having the formula



in which R_a is an alkyl group, comprising heating a compound having the formula R_2AlR' in which R is an α- or β- monosubstituted alkyl group of the type

in which one R″ is hydrogen and the other is alkyl and R‴ is alkyl, at a temperature between about 50° and about 220° C.

4,101,569

PROCESS FOR THE PREPARATION OF 4,4′-DINITRODIPHENYL CARBONATE

Jan Mazanek; Johannes Blahak, and Dieter Arlt, all of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1976, Ser. No. 735,715

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549036

Int. Cl.² C07C *68/06*

U.S. Cl. 260—463 **8 Claims**

1. A process for the preparation of 4,4′-dinitro-diphenyl carbonate which comprises adding to a sulfuric acid solution of diphenyl carbonate maintained at a temperature between −40 and +40° C a stoichiometric or slightly stoichiometric excess of nitric acid relative to said diphenyl carbonate, the sulfuric acid having a strength of 80–100 percent and the concentration of diphenyl carbonate in the sulfuric acid being between 2 and 40 percent by weight based upon the volume of sulfuric acid.

4,101,570

PROCESS FOR THE PRODUCTION OF PERCARBOXYLIC ACID SOLUTIONS IN ORGANIC SOLVENTS

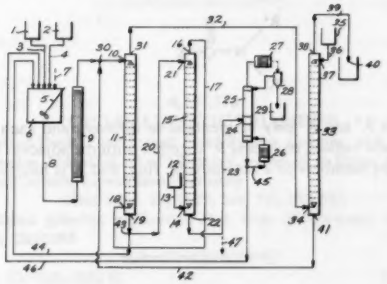
Manfred Krüger; Gerd Schreyer, both of Grossauheim, and Otto Weiberg, Neu-Isenburg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Dec. 17, 1973, Ser. No. 425,290

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1972, 2262970

Int. Cl.² C07C *179/10*

U.S. Cl. 260—502 R **18 Claims**



1. In a continuous process for the production of substantially water free peralkanoic acid having 2 to 4 carbon atoms, said process comprising reacting in a reactor aqueous hydrogen peroxide with an alkanoic acid having 2 to 4 carbon atoms in the presence of an acidic catalyst at an addition mole ratio of hydrogen peroxide to alkanoic acid of 0.5 to 30:1 to form peralkanoic acid and water, counter-currently extracting the aqueous reaction solution with a water immiscible organic solvent, recovering a substantially water free solution of peralkanoic acid in said solvent, and dehydrating the extract by azeotropic distillation the improvement comprising taking at least a portion of the hydrogen peroxide containing aqueous raffinate from said extraction, and feeding it to an evaporating unit, distilling off at least a portion of the water from said raffinate under reduced pressure to form a hydrogen peroxide containing concentrated raffinate and returning the concentrated raffinate to the reactor together with sufficient fresh aqueous hydrogen peroxide and alkanoic acid to restore the starting conditions.

4,101,571

MANUFACTURE OF SULFAMIC ACID HALIDES

Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 10, 1976, Ser. No. 665,684

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2513997; Apr. 3, 1975, 2514646

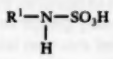
Int. Cl.[2] C07C *143/70, 143/21, 143/15*

U.S. Cl. 260—543 R 13 Claims

1. A process for the manufacture of sulfamic acid chlorides of the formula

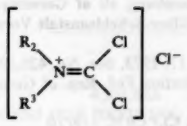
I

where R^1 is an aliphatic or cycloaliphatic radical which comprises: reacting sulfamic acids of the formula



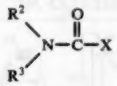
II

where R^1 has the above meanings, or their metal salts, with phosgene in the presence of dichloromethyleneammonium chlorides of the formula



III

or in the presence of carbamic acid halides of the formula



IIIa

where R^2 and R^3 may be identical or different and each is an aliphatic radical, or R^2 and R^3 together with the adjacent nitrogen are members of a heterocyclic ring, and X is halogen.

4,101,572

USE OF PHOSPHORUS DERIVATIVES AS STABILIZING AGENTS FOR PERCHLOROMETHYL MERCAPTAN

Vincent C. Martines, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,121

Int. Cl.[2] C07C *148/04*

U.S. Cl. 260—543 H 7 Claims

1. A method of stabilizing crude perchloromethyl mercaptan produced by the iodine catalyzed chlorination of carbon disulfide which comprises adding an amount of dimethyl methylphosphonate effective to stabilize said crude perchloromethyl mercaptan.

6. A stabilized perchloromethyl mercaptan composition consisting essentially of: (1) crude perchloromethyl mercaptan produced by the iodine catalyzed chlorination of carbon disulfide, and (2) an amount of dimethyl methylphosphonate effective to stabilize said crude perchloromethyl mercaptan.

4,101,573

PRODUCTION OF METHYLDICHLOROPHOSPHANE

Klaus Gehrmann; Alexander Ohorodnik, both of Erftstadt; Karl-Heinz Steil, Hürth, and Stefan Schäufer, Brühl, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,619

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629299; Jan. 14, 1977, 2701389

Int. Cl.[2] C07F *9/02, 9/52*

U.S. Cl. 260—543 P 3 Claims

1. A process for making methyldichlorophosphane by reacting methane with phosphorus trichloride in contact with carbon tetrachloride at temperatures higher than 500° C which comprises: admixing the starting reactant mixture with 2 to 7 mol % of reaction-initiating carbon tetrachloride, based on phosphorus trichloride; reacting the carbon tetrachloride to an extent of 50 to 80% by varying the reaction temperature within the range 550° to 650° C for constant residence times of 0.1 to 0.9 second; and condensing out the resulting reaction mixture containing a residual analytically detectable 20 to 50% proportion of the carbon tetrachloride used.

4,101,574

CYCLOPROPANECARBOXYLIC ACID CHLORIDES

Jacques Martel, Bondy; Chanh Huynh, Villemomble, and Jean Buendia, Fontenay sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

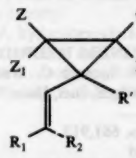
Division of Ser. No. 395,146, Sep. 7, 1973, Pat. No. 3,997,586, which is a division of Ser. No. 168,441, Aug. 2, 1971, Pat. No. 3,786,052, which is a continuation-in-part of Ser. No. 662,278, Aug. 22, 1967, abandoned, and Ser. No. 879,942, Nov. 25, 1969, abandoned. This application Dec. 10, 1976, Ser. No. 749,402

Claims priority, application France, Aug. 26, 1966, 66.74404; Aug. 26, 1966, 66.74405; Feb. 24, 1967, 67.96425; Jun. 16, 1967, 67.11071; Jul. 19, 1967, 67.114833; Nov. 26, 1968, 68.175375

Int. Cl.[2] C07C *61/18*

U.S. Cl. 260—544 L 2 Claims

1. A compound selected from the group consisting of a racemic or optically-active cyclo-propane carboxylic derivative having the formula



wherein Z and Z_1 are selected from the group consisting of lower alkyl having from 1 to 7 carbon atoms and phenyl and Z and Z_1 together represent an alkylene residue having 4 to 5 carbon atoms, T is chlorine, R_1 and R_2 are selected from the group consisting of lower alkyl and phenyl, R′ is selected from the group consisting of hydrogen and lower alkyl, with the proviso that when Z and Z_1 are methyl and R′ is hydrogen, R_2 is other than methyl.

4,101,575

N-ARYL-N′-(2,3-DIHALOGENO-ALKANOYL)-UREAS

Edgar Enders, Cologne; Helmut Kaspers, Leverkusen, and Wilhelm Brandes, Cologne, all al Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 18, 1976, Ser. No. 668,165

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1975, 2512171

Int. Cl.[2] C07C *127/22;* A01N *9/20*

U.S. Cl. 260—553 E 7 Claims

1. An N-aryl-N-(2,3-dihalogeno-alkanoyl)-urea selected from the group consisting of

N-anthracen-1-yl-N'-(2,3-dichloropropionyl)-urea,
N-anthracen-1-yl-N'-(2,3-dibromopropionyl)-urea,
N-anthracen-2-yl-N'-(2,3-dichloropropionyl)-urea,
N-anthracen-2-yl-N'-(2,3-dibromopropionyl)-urea,
N-anthracen-10-yl-N'-(2,3-dichloropropionyl)-urea, and
N-anthracen-10-yl-N'-(2,3-dibromopropionyl)-urea.

4,101,576
2-CARBAMYLMETHYL-OR (DIETHYLCARBAMYL)METHYL-AMINO-4-HYDROXY TOLUENE AND PROCESS FOR PREPARING THE SAME

Gregoire Kalopissis, Neuilly-sur-Seine, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 619,478, Oct. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 263,625, Jun. 16, 1972, abandoned, which is a continuation of Ser. No. 848,342, Aug. 7, 1969, abandoned, which is a division of Ser. No. 525,291, Feb. 7, 1966, Pat. No. 3,591,323. This application Jan. 25, 1977, Ser. No. 762,329

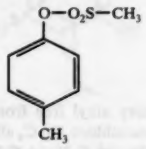
Claims priority, application France, May 6, 1965, 65.16140

Int. Cl.[2] C07C *103/29, 103/76*

U.S. Cl. 260—559 A **5 Claims**

1. A process for preparing 2-amino-4-hydroxy toluene comprising:

(1) reacting paracresol in the presence of pyridine with methane sulfochloride at a temperature of about −2° to 5° C to produce a compound having the formula

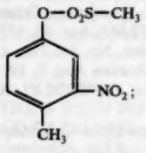


the molar ratio of said cresol to said sulfochloride being 2.0:2.4;

(2) cooling the compound from step (1) in the presence of a mixture of sufficient ice and chlorohydric acid present in a molar ratio of 14.2 moles per 2 moles of cresol;

(3) recovering the product of step (2) from the reaction mass and dissolving said separated product at a temperature of 0° - 5° C in concentrated sulfuric acid;

(4) nitrating the dissolved product of step (3) with a nitrating agent comprising a mixture of nitric acid and sulfuric acid in a ratio of 4.7 cm^3:3.8 cm^3, respectively, at a temperature of 0° - 5° C to produce a product having the formula



(5) pouring the reaction mixture from step (4) over ice to recover the nitrated product of step (4);

(6) reducing the $—NO_2$ substituent on the nitrated product recovered from step (5) to $—NH_2$ with a reducing agent comprising a mixture of tin and hydrochloric acid;

(7) cooling the reaction mixture from step (6) thereby precipitating 2-amino-4-mesyloxy toluene as the chlorostannate thereof;

(8) drying the precipitate from step (7) and dissolving said dried precipitate in water;

(9) subjecting the dissolved precipitate from step (8) to a current of hydrogen sulfide whereby tin sulfide is formed and thereafter removed by filtration;

(10) vacuum concentrating the filtrate from step (9) and cooling said concentrated filtrate thereby precipitating the hydrochloride of 2-amino-4-mesyloxy toluene;

(11) reacting the hydrochloride of 2-amino-4-mesyloxy toluene from step (10) in an inert nitrogen atmosphere with NaOH in amounts of 125 cc per 0.5 mole of said hydrochloride of 2-amino-4-mesyloxy toluene under reflux for about 2 hours; and

(12) cooling the reaction mixture from step (11) and neutralizing the same with HCl thereby producing 2-amino-4-hydroxy toluene.

4. 2-carbamylmethylamino-4-hydroxy toluene.

5. 2-(diethylcarbamyl) methylamino-4-hydroxy toluene.

4,101,577
PROCESS FOR MAKING LOWER ALKYL FORMAMIDES

Donald Lee Smathers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1977, Ser. No. 772,860

Int. Cl.[2] C07C *97/16*

U.S. Cl. 260—561 R **16 Claims**

1. A process for making formamides comprising contacting and reacting an intimate admixture of (a) gaseous CO, and (b) a nontertiary amine in the presence of a C_{1-4} alkanol and a strongly basic anion exchange resin by which a reaction mixture is formed containing a formamide.

4,101,578
CYCLOALIPHATIC TRIAMINES

Manfred Bock, Leverkusen; Josef Pedain, Cologne, and Rudolf Braden, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

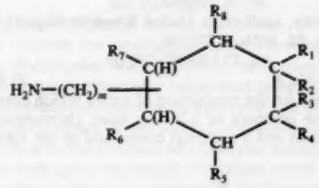
Filed Mar. 17, 1977, Ser. No. 778,632

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614244

Int. Cl.[2] C07C *87/02*

U.S. Cl. 260—563 R **1 Claim**

1. Triamines of the formula (I)



(I)

in which R_1, R_2, R_3 and R_4 are the same or different and represent hydrogen, a methyl group or the group $—(CH_2)_n—NH_2$ where n represents an integer of from 1 to 3 and two of the groups represented by R_1, R_2, R_3 and R_4 are $—(CH_2)_n—NH_2$ groups; m represents 0, 1 or 2; and R_5, R_6, R_7 and R_8 are the same or different and represent hydrogen or a methyl group, the total number of methyl groups represented by R_5, R_6, R_7 and R_8 being limited to a maximum of 2.

4,101,579

PHENETHANOLAMINE ETHERS

David Hartley; Lawrence Henry Charles Lunts, and David Trevor Collin, all of London, England, assignors to Allen & Hanburys Limited, London, United Kingdom

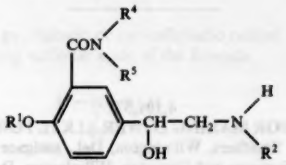
Continuation of Ser. No. 527,306, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 307,623, Nov. 17, 1972, abandoned, which is a continuation of Ser. No. 6,591, Jan. 28, 1970, abandoned. This application Jul. 19, 1976, Ser. No. 706,619

Claims priority, application United Kingdom, Feb. 6, 1969, 6379/69

Int. Cl.[2] C07C *103/29*

U.S. Cl. 260—559 R 4 Claims

1. A compound of the formula:



in which R^1 is a lower alkenyl or alkoxy lower alkyl radical; R^2 is 1-methyl-3-phenylpropyl or 1,1-dimethyl-3-phenylpropyl and R^4 and R^5 are each a hydrogen atom or a lower alkyl radical; or a physiologically acceptable acid addition salt thereof.

4,101,580

3-AMINO-4-HOMOISOTWISTANE AND AN ACID ADDITION SALT THEREOF AND A PROCESS FOR PRODUCING THE SAME

Yoshiaki Inamoto; Hiroshi Ikeda; Yoshiaki Fujikura, all of Wakayama, and Naotake Takaishi, Iwade, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,983

Claims priority, application Japan, Jun. 27, 1975, 50-79437

Int. Cl.[2] C07C *87/32*

U.S. Cl. 260—563 P 4 Claims

1. 3-Aminotricyclo [5.3.1.$0^{3,8}$] undecane and acid addition salts thereof.

4,101,581

PREPARATION OF AZINES BY A CASCADE SYSTEM

Brian John Needham, Newton, and Michael Arthur Smith, Harton, both of England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 87,616, Nov. 6, 1970, abandoned, which is a continuation of Ser. No. 576,060, Aug. 30, 1966, abandoned. This application Feb. 16, 1971, Ser. No. 115,663

Claims priority, application United Kingdom, Sep. 11, 1965, 38884/65; Apr. 23, 1966, 17873/66

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 B 27 Claims

1. In a process for the production of azines which comprises reacting, in the presence of a strong base, chloramine with aqueous ammonia and a carbonyl compound of the formula:

wherein R^1 is selected from the group consisting of hydrogen or 1 – 4 carbon alkyl and R^2 is selected from the group consisting of 1 – 4 carbon alkyl and phenyl, and R^1 and R^2 taken together is cyclohexanone to provide an azine-containing reaction product; the improvement comprising carrying out the reaction in a series of at least two reactors arranged in a concurrent cascade system, the total carbonyl compound being added to the first reactor only, and wherein the pH of the reaction is maintained within the range of 12.8 to 13.5.

4,101,582

2,6-DINITROANILINE HERBICIDES

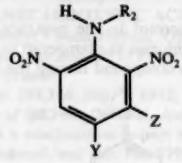
Albert William Lutz, Princeton, and Robert Eugene Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 643,226, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 599,223, Jul. 25, 1975, abandoned, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, said Ser. No. 323,000, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Dec. 20, 1976, Ser. No. 752,357

Int. Cl.[2] C07C *87/62, 93/14*

U.S. Cl. 260—574 24 Claims

1. A compound of the formula:



wherein;

R_2 is C_3–C_7 secondary alkyl free from quaternary carbon atoms or R_2 is monochloro C_3–C_4 alkyl;

Y is CH_3, C_2H_5, C_3H_7 - *n*, C_3H_7 - *i*, C_4H_9 - *i*, sec - C_4H_9, Cl or CF_3; and

Z is CH_3, — CH_2OCH_3 or —$CH(CH_3)OCH_3$,

with the proviso that when Y and Z are methyl, R_2 cannot be 1-ethylbutyl, 1-ethylpropyl, 1-methylpropyl or 1 - methylbutyl.

4,101,583

ALPHA-METHYLTHIO-ALPHA-(2-AMINOPHENYL) ACETALDEHYDE DILOWERALKYL ACETALS

Paul G. Gassman, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 573,069, Apr. 30, 1975, Pat. No. 3,992,392, which is a division of Ser. No. 355,198, Apr. 27, 1973, Pat. No. 3,901,899. This application Aug. 9, 1976, Ser. No. 712,755

Int. Cl.[2] C07C *91/40*

U.S. Cl. 260—575 2 Claims

1. Alpha-methylthio-alpha-(2-aminophenyl) acetaldehyde diloweralkyl acetal.

4,101,584

BISBENZOIN ETHERS AND METHOD OF PRODUCING BENZOIN ETHERS

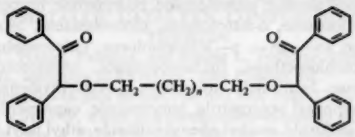
Walter J. Ranus, Jr., Midland Park, and Lester Dennis McClure, Oakland, both of N.J., assignors to Napp Chemicals Inc., Lodi, N.J.

Filed Dec. 10, 1976, Ser. No. 749,523

Int. Cl.[2] C07C *49/84;* C08F *2/46;* B29C *19/02*

U.S. Cl. 260—590 D 8 Claims

1. Alkyl glycol bisbenzoin ethers of the formula:



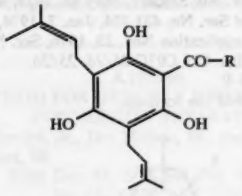
wherein n equals 0,1 or 2.

4,101,585
PROCESS FOR THE PRODUCTION OF DEOXY-ALPHA-ACIDS

Urs Burckhardt, Basel; Lucius Werthemann, Riehen, and Richard Josef Troxler, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,710
Int. Cl.² C07C *49/82*
U.S. Cl. 260—592 **8 Claims**

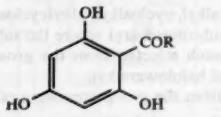
1. Process for the production of deoxy-α-acids of formula I



(I)

wherein

R represents a straight-chain or branched-chain alkyl group having 1 to 5 carbon atoms, by prenylation of acylphloroglucinols of formula II



(II)

wherein R has the meaning given under formula I, under alkaline conditions with a prenyl halide, in which process prenylation is performed in a mixture of water and an organic solvent immiscible with water, in the presence of a phase-transfer catalyst selected from the group consisting of tetraalkylammonium salts, tetraalkylphosphonium salts and crown ethers.

4,101,586
ALDOL REACTIONS WITH BIFUNCTIONAL CO-CATALYSTS

Mary Lease Deem, Bernardsville, and Kenneth Charles Stueben, Bridgewater, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,715
Int. Cl.² C07C *45/08, 49/04*
U.S. Cl. 260—593 R **9 Claims**

1. In the method of converting organic carbonyl compounds selected from the group consisting of aliphatic aldehydes having 1 to about 18 carbon atoms and ketones having from 3 to about 22 carbon atoms to condensation products by a base catalyzed aldol reaction, the improvement which comprises incorporating into the reaction mixture a bifunctional cocatalyst containing both imidazolyl and carboxyl functionalities selected from the group consisting of N^{α}-acyl substituted histidines and copolymers of a 4-vinylimidazole and an α, β-ethylenically unsaturated carboxylic acid having 3 to about 6 carbon atoms, at a molar concentration of at least about 10^{-4} based on the total amount of organic reactants whereby aldol condensation products of said organic carbonyl compounds are produced.

4,101,587
METHOD FOR THE MANUFACTURE OF ORGANO SUBSTITUTED PHOSPHONIUM SALTS

Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1975, Ser. No. 640,380
Int. Cl.² C07F *9/54*
U.S. Cl. 260—606.5 F **9 Claims**

1. A process for preparing the compound $P[(CH(OH)R]_4X$ in which R is H or an alkyl or alkylaryl group of from 1 to 11 carbon atoms, and X is the anion of a mineral acid, HX, which comprises reacting a metal phosphide selected from the group consisting of lithium phosphide, sodium phosphide, potassium phosphide, beryllium phosphide, magnesium phosphide, calcium phosphide, strontium phosphide, barium phosphide, boron phosphide, aluminum phosphide, gallium phosphide, and zinc phosphide, with at least 4 moles of an aldehyde having the formula RCHO, per gram atom of the phosphorus, and at least 1 mole of the said mineral acid, per gram atom of the phosphorus, at a temperature of from −10° C to 100° C in the presence of an inert gas atmosphere, and with at least one and a half moles of water being present per gram atom of the phosphorus of the said metal phosphide.

4,101,588
PRODUCTION OF BIS-(DIMETHYL) ACETALS OF HEXANE DIALDEHYDES

Hans Juergen Nienburg, Heidelberg, and Rudolf Kummer, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 457,577, Apr. 3, 1974, abandoned. This application May 7, 1976, Ser. No. 684,401
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1973, 2317625
Int. Cl.² C07C *41/00*
U.S. Cl. 260—615 A **3 Claims**

1. A process for production of bis-(dimethyl) acetals of hexane dialdehydes with formation of monoaldehydes and residues being substantially suppressed which comprises hydroformylation butadiene with hydrogen and carbon monoxide at a temperature of 100°–140° C and a pressure of 200–400 atmospheres in the presence of a catalytic amount in the range of 10 to 1000 ppm, calculated as rhodium metal and based on the reaction mixture, of a catalyst of the formula

$$X\,Rh\,(CO)\,L_2$$

in which X is chlorine, bromine, or iodine and L is triphenylphosphine or triphenylphosphite, the ratio of Rh to P in said catalyst being in the range of 1:2 to 1:100 in methanol as the solvent, the amount of said methanol being in molar excess in the range of 100% to 1000% mol percent for each formyl group to be formed in the hydroformylation reaction.

4,101,589

1,3,4-TRIOLS AND DERIVATIVES THEREOF

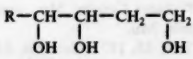
John J. Morrisroe, Whittier, and Thomas F. Banigan, Arcadia, both of Calif., assignors to Pilot Chemical Company, Santa Fe Springs, Calif.

Division of Ser. No. 135,427, Apr. 19, 1971, Pat. No. 3,778,482, which is a continuation-in-part of Ser. No. 687,137, Dec. 1, 1967, abandoned, which is a continuation-in-part of Ser. No. 618,824, Feb. 27, 1967, Pat. No. 3,544,603. This application Dec. 3, 1973, Ser. No. 421,427

Int. Cl.[2] C07C *43/11, 41/02*

U.S. Cl. 260—615 B **7 Claims**

1. A 2 to about a 20 mole ethoxylate of a compound of structure:



wherein R is a linear alkyl group of from about 5 to 9 carbon atoms, ethoxyl groups stemming from plural carbons of said compound.

4,101,590

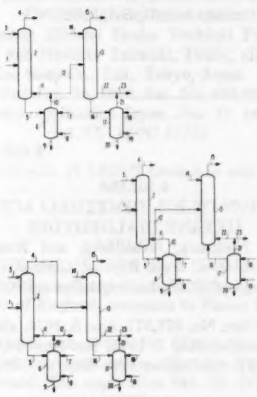
PROCESS FOR SEPARATION AND PURIFICATION OF VINYLPHENOL

Mikio Sato, Chiba; Kinya Tawara, Sohka; Shinpachiro Iwaki, Kobe; Kohji Matsumoto, Saitama, and Kenichi Sekine, Kuki, all of Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Aug. 23, 1976, Ser. No. 716,731

Int. Cl.[2] C07C *39/18, 37/28*

U.S. Cl. 568—750 **21 Claims**



1. A process for purifying crude vinylphenol containing

(a) vinylphenol,

(b) impurities more acidic than vinylphenol comprising phenol and carboxylic acids, and/or

(c) impurities less acidic than vinylphenol comprising alkylphenols having 1 to 4 carbon atoms in the alkyl group thereof, which comprises subject said crude vinylphenol at least once to an alkali extraction comprising countercurrently contacting at a temperature of from −10° to +40° C the crude vinylphenol with an aqueous alkali solution having a concentration of about 0.05 to 3 normal in an amount sufficient for extraction of only vinylphenol and/or impurities more acidic than vinylphenol together with an organic solvent having solubility in water of below 8g/100g H_2O at 20° C and capable of dissolving the individual components of the crude vinylphenol and selected from the group consisting of benzene, toluene, xylene, ethylbenzene, tetralin, diethyl ether, dipropyl ether, di-sec butyl ether, dibenzyl ether, benzyl ethyl ether, amyl alcohol, hexanol, heptanol, cyclohexanol, benzyl alcohol, nitromethane, courmarone, nitropropane, nitrobenzene, o-nitrotoluene, chlorobenzene, bromobenzene, (o—, m—, p—)chlorotoluene, chloronaphthalene, tetrachloroethane, tirchloropropane, trichlorotrifluoroethane, benzontrile, tolunitrile, 2,4-dimethylbenzonitrile, 4-isopropyl benzonitrile, butyronitrile, capronitrile, dibutyl sulfoxide, methyl phenyl sulfoxide, ethyl tolyl sulfone, butyl tolyl sulfone, dibutyl sulfone, ethyl isobutyl sulfone and a mixture containing at least one of these solvents, the amount of said organic solvent being from 1 to 100 times by weight based on the weight of the crude vinylphenol, whereby in each one of the at least one alkali extraction steps vinylphenol is separated from at least some of the impurities.

4,101,591

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

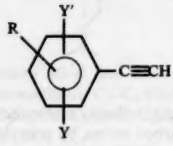
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910. This application Nov. 23, 1976, Ser. No. 744,332

Int. Cl.[2] C07C *25/18, 25/26*

U.S. Cl. 260—649 F **8 Claims**

1. A compound of the formula



where

R is hydrogen, alkyl, cycloalkyl, alkylcycloalkyl, cycloalkenyl, aryl or substituted aryl where the substituent is Y″,

Y and Y′ are each selected from the group consisting of hydrogen and haloloweralkyl,

Y″ is selected from the group consisting of Y, lower alkyl and halo

with the proviso that at least one of Y and Y′ is other than hydrogen.

4,101,592

CATALYTIC HYDROGENATION

Mark R. Rycheck, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 4, 1977, Ser. No. 765,515

Int. Cl.[2] C07C *13/00, 5/02*

U.S. Cl. 260—666 P **10 Claims**

1. A process for hydrogenation of monoolefins which comprises:

contacting in a reaction zone at least one monoolefinic hydrocarbon with hydrogen in the presence of a catalyst consisting essentially of at least one of carbides, nitrides, and silicides of Group VIII, Group VIB, and Group VIIB metals, at such conditions, including temperature and pressure, and for such period of time as to allow conversion of at least some of the monoolefins to corresponding paraffins, said catalyst having been activated prior to said contacting by heating with hydrogen at an elevated temperature and for a period of time sufficient to activate said catalyst for hydrogenation of monoolefins to paraffins.

4,101,593

DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 687,135, May 17, 1976, Pat. No. 4,018,669, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Mar. 25, 1977, Ser. No. 781,389

Int. Cl.² C07C *5/36, 13/00, 15/00*

U.S. Cl. 260—666 A **16 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, and about 0.05 to about 5 wt. % cobalt; wherein the platinum or palladium, rhodium and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,101,594

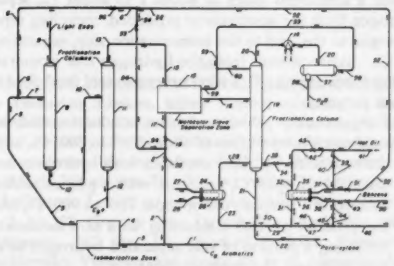
METHOD FOR DRYING A HYDROCARBON CONVERSION APPARATUS

Leroy J. Howard, Jr., Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 19, 1976, Ser. No. 755,373

Int. Cl.² C07C *7/12, 5/00*

U.S. Cl. 260—668 A **11 Claims**



1. A method of drying a hydrocarbon treating apparatus comprising a fractionation column, a process vessel and liquid transfer lines and which is used to perform a hydrocarbon treating process in which a product stream comprising a hydrocarbon having from 7 to 12 carbon atoms per molecule is fractionated which comprises the steps of:

(a) passing a startup stream comprising a preselected hydrocarbon having from 5 to 7 carbon atoms per molecule into the fractionation column used in the hydrocarbon treating process, there being a first and a second reboiler operatively associated with the fractionation column;

(b) isolating the first reboiler from the fractionation column by sealing a liquid and a vapor transfer line connecting the first reboiler to the fractionation column;

(c) vaporizing a portion of the startup stream in the second reboiler to form a first vapor stream which is passed into the fractionation column;

(d) passing a high temperature heat transfer fluid stream through the first reboiler and effecting the vaporization of a liquid stream comprising the preselected hydrocarbon which is simultaneously passed into the first reboiler to form a second vapor stream, superheating the second vapor stream and passing the second vapor stream through a process vessel other than the fractionation column to effect the drying of the process vessel;

(e) terminating the vaporization of the liquid stream and the formation of the second vapor stream when the process vessel has been adequately dried, terminating the passage of the liquid stream into the first reboiler, unsealing the liquid and the vapor transfer lines connecting the first reboiler to the fractionation column, and terminating the passage of the startup stream into the fractionation column; and,

(f) initiating the flow of the product stream into the fractionation column and the use of the first reboiler to generate a third vapor stream which is passed into the fractionation column.

4,101,595

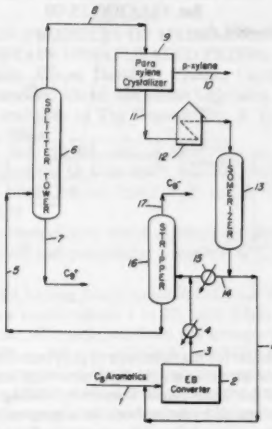
CONVERSION OF ETHYL BENZENE TO PARA XYLENE

Nai Y. Chen, Titusville, N.J., and William J. Reagan, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 793,017

Int. Cl.² C07C *5/24, 3/62, 7/01*

U.S. Cl. 260—668 A **18 Claims**



1. In a process for recovering para-xylene from a source mixture of eight carbon atom aromatics which contains ethyl benzene and each of the xylene isomers by extracting para xylene from a mixture of xylene isomers, isomerizing the resultant mixture lean in para xylene to convert ortho- or meta-xylene to para-xylene, recycling the resultant isomerizate to the said extraction and adding to the loop of extraction and isomerization fresh charge containing each of the xylene isomers; the improvement whereby to provide said fresh charge reduced in ethyl benzene content and enhanced in para-xylene content above the thermodynamic equilibrium value which comprises converting said source mixture at conversion conditions of temperature between about 650° F. and 1000° F., pressure of 50 to 500 pounds per square inch, in admixture with 0.1 to 15 mols of hydrogen per mol of hydrocarbon and a space velocity of 1 to 100 volumes of hydrocarbon per volume of the hereinafter recited zeolite with a catalyst composite of a strong hydrogenation/dehydrogenation metal of Group VIII of the Periodic Table and a shape selective moderate acid zeolite characterized by a silicate/alumina ratio greater than 12, a constraint index of 1 to 12, a xylene sorption capacity greater than 1 gram per 100 grams of zeolite and an ortho-xylene sorption time for 30 percent of said capacity greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a xylene pressure of 4.5 ± 0.8 mm. of mercury.

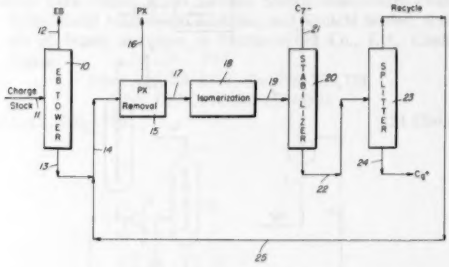
7. A process for converting a monoalkyl benzene having an alkyl substituent of 2 to 4 carbon atoms to a dialkyl benzene mixture in which para isomer is present in a proportion greater than the thermodynamic equilibrium value which comprises converting said monoalkyl benzene at conversion conditions of temperature between about 650° F. and 1000° F., pressure of 50 to 500 pounds per square inch, in admixture with 0.1 to 15 mols of hydrogen per mol of monoalkyl benzene and a space velocity of 1 to 100 volumes of dialkyl benzene per volume of the hereinafter recited zeolite with a catalyst composite of a strong hydrogenation/dehydrogenation metal of Group VIII of the Periodic Table and a shape selective moderate acid zeolite characterized by a silica/alumina ratio greater than 12, a constraint index of 1 to 12, a xylene sorption capacity greater than 1 gram per 100 grams of zeolite and an ortho-xylene sorption time for 30 percent of said capacity greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a xylene pressure of 4.5 ± 0.8 mm. of mercury.

4,101,596

LOW PRESSURE XYLENE ISOMERIZATION

Kenneth M. Mitchell, Mount Laurel, N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Company, New York, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,214
Int. Cl.² C07C *15/08*
U.S. Cl. 260—668 A **8 Claims**



1. In a process for manufacture of p-xylene from a mixture of eight carbon atom aromatic hydrocarbons containing ethyl benzene and the three xylene isomers by adding said mixture to a cyclic stream of hydrocarbons in a processing loop which includes a recovery stage for removal of p-xylene from the stream followed in turn by an isomerization stage for low pressure catalytic isomerization of xylenes, a distillation stage for removal of compounds boiling above and below the boiling range of eight carbon atom aromatic compounds and return of the eight carbon atom hydrocarbon stream derived from said distillation to said recovery stage;

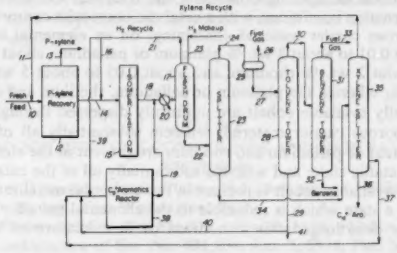
the improvement resulting in prolonged on-stream periods of the process between catalyst regenerations which comprises adding said mixture to said loop substantially free of peroxide, conducting the said isomerization stage in the presence of a catalyst having activity for isomerization of xylenes and for conversion of ethyl benzene to higher and/or lower boiling hydrocarbons consisting essentially of an aluminosilicate crystalline zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12 at a partial pressure of said eight carbon atom alkyl aromatic compounds below about 100 pounds per square inch, a temperature range between about 500° F. and about 800° F. and a space velocity of 3 to 13 pounds of said eight carbon atom aromatic compounds per pound of said zeolite per hour, initiating the isomerization at a temperature in the lower portion of said range at conditions of temperature, pressure and space velocity to convert ethyl benzene at a rate to maintain ethyl benzene concentration in the loop approximately equal to that in said mixture, observing ethyl benzene in said loop and increasing temperature in said isomerization stage within said range during the process to maintain ethyl benzene conversion at a rate to maintain ethyl benzene concentration in the loop approximately equal to that in said mixture.

4,101,597

RECOVERY OF P-XYLENE AND BENZENE FROM EIGHT CARBON ATOM AROMATIC FRACTIONS

Lloyd L. Breckenridge, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,231
Int. Cl.² C07C *5/24, 3/62, 7/01*
U.S. Cl. 260—668 A **5 Claims**



1. In a process for recovery of p-xylene from a fresh feed of eight carbon atom alkyl aromatic compounds including ethyl benzene and the three xylene isomers by separating p-xylene from a mixture of said fresh feed with xylene recycle as hereinafter defined, subjecting the mixture depleted of p-xylene to isomerization by contact with hydrogen in the presence of a catalyst consisting essentially of a metal having hydrogenation/dehydrogenation catalyst properties and a crystalline aluminosilicate zeolite having a silica/alumina ratio of at least 12 and a constraint index of about 1 to about 12, separating hydrogen from the isomerate so produced, recycling separated hydrogen to the feed to the isomerization step, separating C_9^+ and C_7^- hydrocarbons from the hydrogen free isomerate and adding the remaining C_8 hydrocarbons to said fresh feed as said xylene recycle;

the improvement which comprises conducting said isomerization at a temperature of about 550° to 700° F., admixing the separated C_9^+ hydrocarbons with hydrogen, contacting the hydrogen/C_9^+ mixture with a porous acidic solid catalyst at a temperature of about 750° to 900° F., blending the product of such contacting with said isomerate, and recycling a portion of said separated hydrogen to admixture with said C_9^+ hydrocarbons.

4,101,598

ISOMERIZATION OF ALKYL BENZENES USING A NU-1 ZEOLITE CATALYST

Thomas Vincent Whittam, Stockton-on-Tees, and Barry Youll, Middlesbrough, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 727,773, Sep. 29, 1976, Pat. No. 4,060,590. This application Aug. 29, 1977, Ser. No. 828,827
Claims priority, application United Kingdom, Oct. 3, 1975, 40631/75; Feb. 9, 1976, 4957/76; Jul. 29, 1976, 31641/76
Int. Cl.² C07C *15/08*
U.S. Cl. 260—668 A **3 Claims**

1. A process for the isomerisation of alkyl benzenes which comprises contacting a feed of an alkyl benzene or a mixture of alkyl benzenes under isomerisation conditions in the liquid or vapour phase with a catalyst comprising zeolite nu-1 having a composition expressed by the formula

$$0.9 \text{ to } 1.3\ R_2O\ .\ Al_2O_3\ .\ 20 \text{ to } 150\ SiO_2\ .\ 0 \text{ to } 40\ H_2O$$

where R is one or more of hydrogen, ammonium, phospho-

nium or $1/n$ of a cation having a valency n and having a X-ray diffraction pattern when R is H substantially as shown in Table 1.

4,101,599

HYDROGENATION PROCESS OF OLEFIN POLYMERS FOR PRODUCING WHITE OILS

Guy F. S. Debande, Watermael; Raymond N. M. Cahen, Etterbeek, and Jacques F. J. Grootjans, Leefdael, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Mar. 15, 1977, Ser. No. 777,907

Claims priority, application Luxembourg, Mar. 16, 1976, 74570

Int. Cl.[2] C07C *5/14*

U.S. Cl. 260—683.9 **12 Claims**

1. A process for hydrogenating a liquid polymer derived from olefin units containing 4 carbon atoms, which comprises the step of hydrogenating said polymer at a hydrogen pressure of between about 20 and about 120 kg/cm^2, a liquid hourly space velocity of between about 0.25 and 4 hr^{-1}, a hydrogen:polymer ratio of between about 250 and 6,000 Nl/l, and at a temperature of between about 130° and about 250° C in the presence of a catalyst comprising palladium on an alumina support, said support exhibiting a total pore volume of from about 0.25 ml/g to about 2.5 ml/g, wherein about 35 to about 50% of said pore volume is provided by small size pores having a pore size distribution lower than about 300A and about 25 to about 35% of said pore volume is provided by large size pores having a pore size distribution higher than about 300A and wherein the pore size distribution of the large size pores is at least 1.5 times that of the small size pores, whereby a white oil having an iodine number of less than about 0.26 is obtained.

4,101,600

METHOD OF DIMERIZATION OF ALPHA-OLEFINS

Viktor Ivanovich Zhukov, ulitsa Neftezavodskaya, 4, kv. 1; Nikolai Petrovich Shestak, Pyatigorsky pereulok, 3, kv. 5, both of Grozny; Gennady Petrovich Belov, Noginsky raion, Chernogolovka, Shkolny bulvar, 5, kv. 53, Moskovskaya oblast; Maria Nikolaevna Dyadjunova, ulitsa Mozdokskaya, 1, kv. 2, Grozny; Leonid Alexandrovich Shilov, ulitsa Polezhaeva, 7, kv. 27, Grozny; Ivan Davydovich Shevlyakov, ulitsa Nakhimova, 162, kv. 19, Grozny; Fridrikh Stepanovich Dyachkovsky, Vorobievskoe shosse, 2[b], kv. 9, Moscow; Alexandr Grigorievich Liakumovich, ulitsa Galeeva, 10, kv. 8, Kazan; Pavel Alexandrovich Vernov, Nizhnekamsk, ploschad 50 let Oktyabrya, 6, kv. 87, Tatarskaya ASSR, and Jury Mikhailovich Sivakov, ulitsa Dybenko, 22, kv. 385, Moscow, all of U.S.S.R.

Filed Feb. 17, 1977, Ser. No. 769,426

Claims priority, application U.S.S.R., Feb. 23, 1976, 2320351

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 D **3 Claims**

1. In a method for the dimerization of alpha-olefins, wherein at least one alpha-olefin is mixed with a two component catalyst consisting of organic compounds of titanium, having the general formula $Ti(OR)_4$, and of aluminum, having the general formula AlR_3, where R is an alkyl having from 1 to 6 carbon atoms, or an aryl, in a medium of a hydrocarbon solvent, at a temperature from 0° to 100° C, and a pressure of alpha-olefins from 1 to 30 atm., the improvement which comprises the pretreatment of said constituents with an ethylene-hydrogen mixture containing from 5 to 95 percent by volume of hydrogen, said pretreatment being effected at a temperature of about 0° to 100° C, and a pressure of the ethylene-hydrogen mixture of about 0.2 to 15 atm., for about 1 to 120 minutes.

4,101,601

EPOXY-CATALYST ADDITIVE SYSTEM TO PRODUCE HIGHER I.V. POLYBUTYLENE TEREPHTHALATE FROM LOW I.V. POLYMER

Norman W. Thomas, Warren, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,276

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—836 **13 Claims**

1. A process for preparing branched chain polybutylene terephthalate having increased melt strength and useful in extrusion applications, which process comprises reacting polybutylene terephthalate in the molten state with at least one epoxy branching agent containing at least two epoxy groups per molecule of epoxy branching agent, in the presence of a catalytic amount of at least one catalyst selected from the group consisting of alkyl triphenyl phosphonium halide and alkenyl triphenyl phosphonium halide wherein the alkyl groups contain from 1 to 10 carbon atoms, the alkenyl groups contain from 2 to 6 carbon atoms, and the halide anion is selected from the group consisting of chloride and bromide, to produce said branched chain polybutylene terephthalate having increased melt strength.

4,101,602

REACTION PRODUCTS OF HYDRAZIDES AND CERTAIN UNSATURATED ESTERS

Hubert J. Fabris, Akron; David P. Gruber, Cuyahoga Falls; David R. Sponseller, Akron, and Heinz Uelzmann, Tallmadge, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 738,775, Nov. 4, 1976, Pat. No. 4,061,845. This application May 23, 1977, Ser. No. 799,814

Int. Cl.[2] C08F *299/04*; C08G *2/18, 12/22, 81/02*

U.S. Cl. 260—839 **11 Claims**

1. A reactive composition useful in forming polymeric coatings and adhesives and comprising a mixture of (I.) a copolymer of

(a) a hydrazide having the formula $R(C(O)—NH—NHR')_a$ where a is a number from 1 to 10, each (O) is a carbonyl oxygen atom, R is selected from the group consisting of —R′, —OR′, —NR$_2$′, —NHNHR′, —C(O)NHNHR′ and polyvalent organic radicals having molecular weights of from 14 to 15,000, and each R′ is a hydrogen atom or a monovalent organic radical having a molecular weight of from 14 to 450 and being free of functions which react with methyl acrylate at 80° C., and

(b) an unsaturated organic ester having from 1 to 5 aliphatic double bonds activated by a carbonyl group, the average number of said carbonyl-activated double bonds being greater than one, and having a molecular weight of from about 71 to 12,000, and containing (II.) up to about 70 percent by weight of said mixture of a reactive resin selected from the group consisting of reactive melamine, urea and phenol-aldehyde resins, their alkylated derivatives and mixtures thereof.

4,101,603

HIGH SOLIDS COATING COMPOSITIONS

Oliver Wendell Smith, South Charleston, and Joseph Victor Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,185

Int. Cl.[2] C08L *61/32, 67/04*

U.S. Cl. 260—850 **11 Claims**

1. A high solids composition comprising from (I) 20 to 80 weight percent of a polycaprolactone derivative and (II) from 80 to 20 weight percent of a combined mix; wherein said combined mix (II) is a mixture of a methylolated melamine and a non-volatile low molecular weight polyol having a molecular weight of from 62 to about 1000 and from 2 to 6 hydroxyl groups wherein the methylolated melamine comprises from 40

to 90 weight percent of said combined mix; and wherein said polycaprolactone derivative (I) is a carboxyl modified polycaprolactone adduct reaction product mixture of (i) a polycaprolactone polyol and (ii) from 0.1 to 1 carboxylic acid anhydride equivalent for each hydroxyl equivalent present in the polycaprolactone polyol of an intramolecular anhydride of a polycarboxylic acid produced by reacting (i) and (ii) at from about 75° C. to 200° C.

4,101,604

UNSATURATED POLYESTER MOLDING COMPOSITIONS

Eugene Hugh Rowe, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 18, 1977, Ser. No. 816,230
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—862 **33 Claims**

1. An unsaturated polyester molding composition comprising:

(a) an unsaturated polyester resin,

(b) a polymerizable monomer,

(c) from about 1 to about 30 parts by weight of an epihalohydrin polymer per 100 parts by weight of the combined weight of said unsaturated polyester resin and polymerizable monomer.

4,101,605

THERMOPLASTICPOLYESTER/BLOCK COPOLYMER BLEND

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application May 5, 1977, Ser. No. 794,156
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—873 **18 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 96 parts by weight of a block copolymer and about 96 to about 4 parts by weight of a saturated thermoplastic polyester so as to form at least partial continuous interlocking networks wherein:

a. said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

b. said saturated thermoplastic polyester has a generally crystalline structure, a molecular weight in excess of about 20,000, and a melting point over about 120° C and is selected from the group consisting of:

(i) the condensation product of a dicarboxylic acid and a glycol;

(ii) polypivalolacetone;

(iii) polycaprolactone.

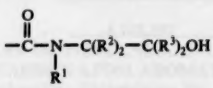
4,101,606

METHOD FOR CURING POLYMERS CONTAINING ONE OR MORE CARBOXY OR ANHYDRIDE FUNCTIONS BY MEANS OF POLYMERS HAVING HYDROXYAMIDE GROUPS, AND COMPOSITIONS

Harry J. Cenci, Warminster, and Graham Swift, Bluebell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 454,645, Mar. 25, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,553
Int. Cl.[2] C08G *69/48, 81/00*
U.S. Cl. 260—857 UN **25 Claims**

1. A method of curing addition polymers having carboxy groups, carboxylic anhydrides or salts of said carboxy groups which comprises the steps of (1) mixing said polymer with a different addition polymer containing two or more pendant β-hydroxyalkyl amide groups of the formula:



IV

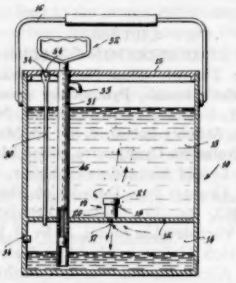
wherein R^1 is hydrogen, alkyl having 1 to 5 carbon atoms, or hydroxyalkyl having from 1 to 5 carbon atoms; R^2 and R^3 are the same or different radicals selected from hydrogen, straight or branched chain alkyl having from 1 to 5 carbon atoms, or one of the R^2 and one of the R^3 radicals joined together with the carbon atoms to which they are attached form cycloalkyl and (2) heating the mixture at a temperature of from about 125° to 400° C. until a cured polymer is obtained.

4,101,607

APPARATUS FOR AERATING A LIQUID

Philip D. Bart, Tamarac, Fla., assignor to PBI, Inc., Fort Lauderdale, Fla.

Filed Jul. 1, 1976, Ser. No. 701,643
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—36 R **24 Claims**



1. Apparatus for aerating a liquid comprising a single vessel including a substantially continuous partition dividing said vessel into an upper chamber for containing an initial quantity of liquid and a quantity of unpressurized gas and positionable below said upper chamber when said apparatus is oriented in an upright manner, and first vent means for conducting said liquid from said upper chamber to said lower chamber to increase the pressure of said gas in said lower chamber and for conducting said gas from said lower chamber to said upper chamber including a passageway having a first end communicating with said upper chamber and a second end communicating with said lower chamber, whereby liquid in said upper chamber can flow by gravity slowly through said passageway into said lower chamber, thereby causing increased pressure upon gas in said lower chamber, and said gas intermittently flows upward through said passageway into said upper chamber where it forms bubbles which rise through and aerate said liquid in said upper chamber.

4,101,608

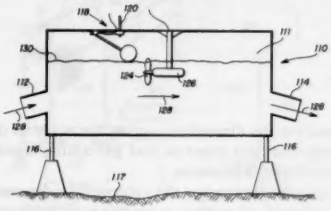
OXYGEN IMPREGNATION METHOD

Jep T. Bracey, Shepherd, Tex., assignor to Martin L. Towler, Galveston and Jack M. Langdon, Granbury, both of Tex., part interest to each

Continuation of Ser. No. 611,906, Sep. 10, 1975, abandoned, which is a division of Ser. No. 420,214, Nov. 29, 1973, abandoned, Continuation-in-part of Ser. No. 385,056, Aug. 2, 1973, Pat. No. 3,903,636, which is a continuation of Ser. No. 202,839, Nov. 29, 1971, abandoned. This application Dec. 17, 1976, Ser. No. 751,840

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—36 R 3 Claims



1. A method for dissolving oxygen in the thermocline region of a stratified body of water comprising the steps of:

immersing receptacle means in said body of water at a depth below the thermocline, said receptacle means comprising a top wall and a side wall extending downwardly from the periphery of said top wall,

introducing a flow of oxygen into said receptacle means to establish a volume of oxygen in a region bounded by said top wall, said side wall, and the surface of said body of water underlying said volume of oxygen, and thereby maintaining a quiescent water-oxygen interface,

exhausting oxygen from said receptacle means by absorption into said body of water through the surface contact of the water with the oxygen, and

replenishing said volume of oxygen in said receptacle means by supplying oxygen directely to said volume of oxygen at a rate not greater than the rate oxygen is absorbed by said body of water from said volume of oxygen in said receptacle means so that gases are not allowed to escape and flow in an upward direction to disturb the thermocline and destratify the body of water.

4,101,609

COVER HOLDER FOR EVAPORATIVE COOLER

Paul E. Sumrow, 45115 N. Redwood Ave., Lancaster, Calif. 93534

Filed Oct. 5, 1976, Ser. No. 730,273

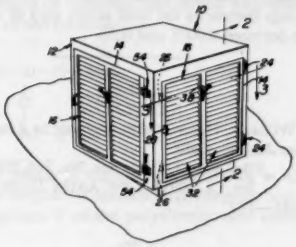
Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—105 1 Claim

1. A cover for an evaporative cooler, comprising, in combination:

(a) a cover member hingedly mounted on an open side of an evaporative cooler; and

(b) holder means associated with the evaporative cooler and with the cover member for hingedly mounted the cover member on the cooler for swinging movement with respect to the cooler, the holder means including a pad frame hingedly mounted on the cover member, an evaporative cooler pad arranged between the pad frame and the door, the cover member forming a swinging door panel for a main frame of the evaporative cooler, the pad frame and door panel being hingedly mounted adjacent one another for swinging movement away from one another about separate, but adjacent, parallel axes, the pad frame including a spring latch mounted on the pad frame at a point spaced from the axis of hingedly mounting of the pad frame the extent of the pad frame, and keeper means being provided on the holding means for engaging with the latch retaining the pad frame substantially parallel to the door panel, the cover member including a support



element, a louver mounted on the support element and arranged for movement between an open position permitting fluid to flow through the cover member and a closed position blocking fluid flow through the cover member.

4,101,610

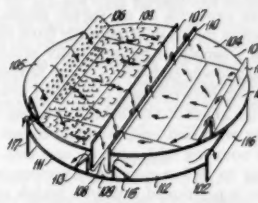
LIQUID-GAS CONTACTING TRAY

Robert Duncan Kirkpatrick, Tonawanda, and David William Weiler, Burt, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,941

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—110 22 Claims



1. In a circular-edged liquid-gas contacting tray of the slotted sieve-type for effecting intimate contact between rising vapor and liquid flowing across a member of the tray having main flat top and bottom surfaces from a liquid inlet at one edge of said tray member along a liquid flow path on said main top surface including a diverging flow section adjacent said inlet to a liquid discharge at an opposite edge of said tray member, with a plurality of fixed sized openings distributed across said member and extending therethrough with walls normal to said main flat top and bottom surfaces for gas flow, and a plurality of elevated portions formed from said member across said surfaces each with an upper surface raised from said main flat top surface having a front leading edge separated from said main flat top surface to form an elongated slot opening therewith of greater width than height, the raised upper surface being inclined to said main flat top surface and having a back edge integral with such surface and each elevated portion being spaced from adjacent elevated portions by said main flat top surface entirely surrounding such elevated portion, the improvement comprising: a first band portion of said tray member adjacent to said liquid inlet and extending therefrom downstream for distance at least 20% of the length of the tray diametral streamline from said liquid inlet to the tray transverse centerline and extending traversely outwardly from vicinity of the tray diametral streamline for distance at least 25% of the transverse length of said liquid inlet, with angular orientation of slot openings in said tray member first band portion with respect to and away from the tray diametral

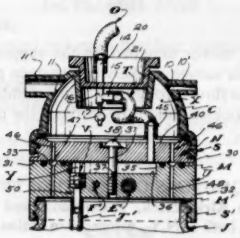
streamline such that the slot angle of individual slots is greater than the angle formed by the diametral streamline and a tangent line at the tray member outer edge at the point of intersection with said liquid inlet, and with the density of slotting in said first band portion such that the ratio of the total area of the slot openings therein to the total active area of said first band portion is between 0.0001 and 0.30.

4,101,611

NEBULIZER

David E. Williams, Hemet, Calif., assignor to Amark Industries, Inc., San Jacinto, Calif.

Filed Feb. 7, 1977, Ser. No. 766,263
Int. Cl.[2] B01F *3/04*; A61M *15/00*
U.S. Cl. 261—142 **17 Claims**



1. An elongate vertical water heating unit of heat conducting and storing material in combination with a fluid container having an upper open end and a supply of water within and with a container cap with an air supply means, air delivery means and aspirator means to draw water from said supply and connected with a supply of oxygen under pressure; said unit having upper and lower ends and a water heating chamber in spaced relationship between said upper and lower ends, coupling means at the lower end of the unit coupling the upper end of the container with said unit, coupling means at the upper end of the unit coupling said cap with said unit, said unit and cap cooperating to define a mixing chamber in which said aspirator means is positioned and with which said air supply and delivery means communicate, a water inlet means between the heating chamber and the water supply, water outlet means between the heating chamber and said aspirator means, a heater opening entering one side of and extending into the unit between the upper and lower ends thereof and in spaced relationship from said heating chamber and from said water inlet and outlet means and a resistance heater positioned in said opening, said heater having means at the exterior of the unit connected with the power supply, said heater heating said unit to heat the water in the heating chamber and to temper the atmosphere in said mixing chamber.

4,101,612

OPTICAL METHOD AND APPARATUS FOR DETERMINING STRESS RELAXATION

Robert I. Barker, Cuyahoga Falls, and David P. King, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 642,705, Dec. 22, 1975, Pat. No. 4,037,968. This application Sep. 10, 1976, Ser. No. 721,152
Int. Cl.[2] G01B *5/08*
U.S. Cl. 264—22 **10 Claims**

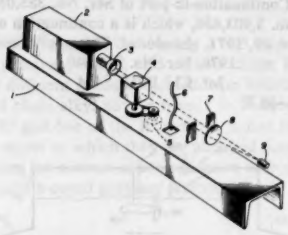
1. A method of measuring stress relaxation of extruded material which comprises extruding a continuous strand of the material from an orifice while optically monitoring the dimension across the material, then discontinuing the extrusion while continuing to monitor the dimension across the material, and calculating the time rate of change of the dimension.

8. Apparatus for measuring stress relaxation of extrudated material comprising,

extrusion means for extruding a strand of material between the edges of an aperture,

control means to provide extrusion during a preselected time of extrusion and to discontinue extrusion during a preselected time of resting,

optical means for scanning the extrudate in the aperture,



measuring the dimensions across the material during said preselected time intervals and generating signals proportional to the dimensions,

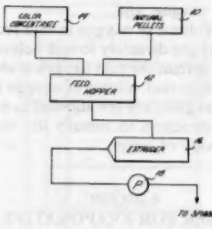
and means for integrating the values of the dimension during the interval of resting comprising an integrator circuit adapted to integrate the signal generated during the interval of resting.

4,101,613

PRODUCTION OF SHAPED, HIGH POLYMERIC ARTICLES

David Norwood, Baltimore, Md., assignor to Concorde Fibers, Inc., Columbia, Md.

Filed Oct. 15, 1975, Ser. No. 622,555
Int. Cl.[2] B29B *3/02*
U.S. Cl. 264—40.3 **2 Claims**



1. In a method of mixing natural thermoplastic, high polymer material and a coloring agent in yarn producing equipment, in which are provided hopper means for receiving the material and the agent and in which is formed a mixture thereof, feed means for continuously delivering the agent to the hopper means and including means for measuring doses of the agent for delivery thereof to the hopper at intervals, means for extruding the mixture and a spinneret, means for drawing the mixture from the hopper through the extruder, and metering pump means for delivering the throughput of the extruder to the spinneret to form yarns; the improvement comprising applying a first control signal to the metering pump means, deriving a second control signal from the first signal, which is proportional to the first signal, applying the second control signal to the means for measuring the doses of the agent for delivery thereof at intervals to the hopper to thereby regulate the interval between delivery of measured doses of the coloring agent to maintain predetermined portions of said material and coloring agent in the mixture in proportion to the output of the extruder.

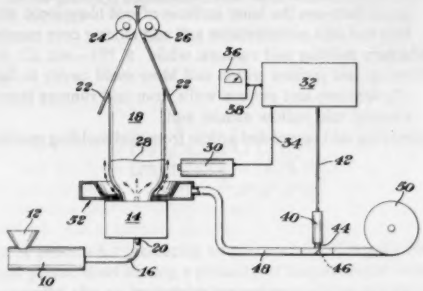
4,101,614
BLOWN FILM PROCESS

Carl B. Havens, Fresno, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 554,951, Mar. 3, 1975, abandoned, which is a continuation of Ser. No. 376,834, Jul. 5, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,984

Int. Cl.² B29F *3/08*

U.S. Cl. 264—40.6 **2 Claims**



1. In a blown film process wherein film is produced through extruding a continuous molten tube of a film forming heat plastified synthetic resinous material, stretching or drawing the tube about a trapped air or gas bubble, and simultaneously cooling the tube, the steps comprising: monitoring the temperature of the film in a controlled area that is positioned between the frost line and extrusion die head, the control area being remote from and spaced sufficiently downwardly from the frost line so as to be less influenced by crystallization effects, cooling the film about its circumference between the control area and extrusion die head, setting a control temperature for the control area, comparing the monitored temperature with the control temperature, increasing or decreasing the rate of said cooling step responsive to the conditions of upward or downward drift, respectively, of the monitored temperature from the control temperature, whereby the process is characterized by an essentially constant temperature in the control area irrespective of cyclic variations in the operating parameters of the process.

4,101,615
PROCESS FOR PRODUCING ALUMINA FIBER OR ALUMINA-SILICA FIBER

Shozo Horikiri, Amagasaki; Kozo Tsuji, Ibaraki; Yasuaki Abe, Toyonaka; Akio Fukui, Ibaraki, and Eiichi Ichiki, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 443,245, Feb. 19, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 606,023

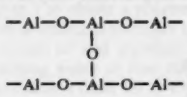
Claims priority, application Japan, Feb. 20, 1973, 48-20568; Jun. 5, 1973, 48-64231

Int. Cl.² C01F *7/02*; C04B *35/64*

U.S. Cl. 264—63 **18 Claims**

1. A process for producing alumina fiber or alumina-silica fiber, which consists essentially of (i) spinning a solution of at least one polyaluminoxane or of a mixture of at least one polyaluminoxane and one or more kinds of silicon-containing compounds in an organic solvent to give a precursor fiber, (ii) hydrolyzing the resulting precursor fiber, and then (iii) calcining the hydrolyzed fiber, said polyaluminoxane being one or more kinds of polymers or copolymers which mainly consist of the structural units of the formula:

wherein the pendant members Y are one or more kinds of groups selected from the group consisting of alkyl having 1 to 18 carbon atoms, alkoxy having 1 to 18 carbon atoms, acyloxy having 1 to 18 carbon atoms phenyl and phenoxy, and may be partially a halogen or hydroxy, and which may also contain cross-linkages of the formula:



the amount of which in the polymer molecule is within the range that the polymer is soluble in the organic solvent, and said pendant groups Y of the polyaluminoxane satisfying the conditions:

$$f(\mathrm{HCOO}) + f(\mathrm{CH_3COO}) + f(\mathrm{F}) + f(\mathrm{Cl}) + f(\mathrm{Br}) + f(\mathrm{I}) + f(\mathrm{OH}) \geqq 0.2$$

wherein $f(R)$ means the mole fraction for a particular group: R as defined for the pendant group Y, or

$$f(R) = \frac{\text{Number of group: } R \text{ in the polyaluminoxanes}}{\text{Number of aluminum atoms in the polyaluminoxanes}}$$

being in the range of from 0.0 to 1.0, and

$$\sum_{n=1}(n-1)f(\mathrm{C}_n\mathrm{H}_{2n+1}) + \sum_{n=1}nf(\mathrm{C}_n\mathrm{H}_{2n+1}\mathrm{O}) + \sum_{n=1}(n+1)f(\mathrm{C}_{n-1}\mathrm{H}_{2n-1}\mathrm{COO}) + 4.5f(\text{phenyl}) + 5.5f(\text{phenoxy}) \leqq 8$$

wherein n is an integer, and further the average degree of polymerization of the polyaluminoxanes being in the range of 5 to 1,000, and the amount of the silicon-containing compounds to be mixed into the solution being not greater than an amount such that the silica content in the alumina-silica fiber obtained after the calcination is not greater than 60% by weight.

4,101,616
PROCESS FOR PRODUCING Si_3N_4 ARTICLE

Sergei-Tomislav Buljan, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 627,362, Oct. 30, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,516

Int. Cl.² C01B *21/06*

U.S. Cl. 264—65 **2 Claims**

1. Process for producing self-supporting fibrous articles consisting essentially of alpha Si_3N_4 comprising:

(a) forming a green body of low bulk density within the range of about 0.1 g/cm³ to 0.8 g/cm³ of substantially amorphous Si_3N_4 powder, and

(b) heat treating the body at a temperature within the range of about 1550° C to 1750° C for from about 0.25 to 5 hours in a non-oxidizing atmosphere to promote in situ formation of fibrous crystalline alpha Si_3N_4 from the amorphous Si_3N_4particles.

4,101,617
METHOD FOR INJECTION MOLDING OF HOLLOW SHAPED BODIES FROM THERMOPLASTIC RESINS

Ernst Friederich, Darmstadt, Fed. Rep. of Germany, assignor to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 9, 1976, Ser. No. 647,793

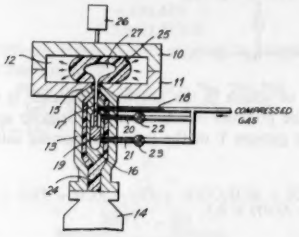
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1975, 2501314

Int. Cl.² B29C *5/06*

U.S. Cl. 264—93 **8 Claims**

1. A method for making a hollow shaped body from a thermoplastic resin by injection molding, which method comprises injecting an amount of molten resin sufficient for the preparation of the hollow shaped body from an injection nozzle into a

mold through an injection aperture in said mold, injecting gas under pressure through said injection nozzle and aperture to expand and distribute the molten resin over the interior surfaces of the mold, whereby said hollow shaped body is formed within said mold with a gas entry opening in said hollow shaped body, cooling the hollow shaped resin body so formed



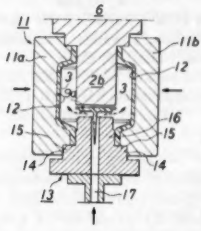
to a temperature beneath the softening point of the resin, separating said mold and said injection nozzle after said resin has cooled beneath its softening point, whereby the interior of said hollow shaped body is opened to the atmosphere through said injection aperture and gas-entry opening to equalize the pressure within said body with ambient pressure, and then opening said mold to remove said hollow shaped body.

4,101,618

INJECTION BLOW MOLDING METHOD FOR HOLLOW ARTICLE HAVING OPENINGS AT BOTH ENDS

Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

Filed Nov. 29, 1973, Ser. No. 420,231
Claims priority, application Japan, Dec. 4, 1972, 47-121385
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—97 **1 Claim**



1. An injection blow molding method for making a hollow article being open from end-to-end, by means of a molding machine having at least two laterally displaceable injection mold members, a stationary core member and a movable core member, at least two laterally displaceable blow mold members and a closing core member, said movable core being longitudinally displaceable and movable between said injection mold and said blow mold, said method comprising the steps of:

axially aligning said movable core to a position in closely adjacent relationship with said stationary core;

forming an injection mold cavity by laterally moving said injection mold members into engagement with said movable and stationary core members;

injecting plasticized material into said cavity to form a parison, said parison including runners between the internal wall surfaces thereof;

laterally displacing said injection mold members from the parison thus formed;

axially withdrawing said movable core member and said parison thereon from the vicinity of said stationary core member, a first end of said parison being sealed by said movable core;

displacing said movable core and parison to said blow mold;

axially aligning said movable core member with said closing core member;

sealing the second end of said parison by means of said closing core member;

laterally displacing said blow mold members toward said parison to form a blow mold cavity, the ends of said parison being hermetically sealed by being tightly engaged between the inner surfaces of said blow mold members and said movable core and said closing core member;

centrally holding said runners; while

blowing said parison within said blow mold cavity to laterally separate said parison walls from said runners thereby forming said hollow article; and

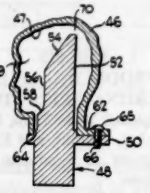
removing said completed article from said molding machine.

4,101,619

METHOD OF MAKING A DOLL HEAD

Lyle A. Conway; Rouben T. Terzian, both of Chicago, and Donald K. Fletchic, Cicero, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Division of Ser. No. 500,676, Aug. 26, 1974, Pat. No. 3,990,175. This application Jun. 10, 1976, Ser. No. 694,560
Int. Cl.[2] B29C *5/04, 5/12*
U.S. Cl. 264—156 **8 Claims**



1. A method of making a doll head for the excretion of liquid from the interior of the head, comprising the following steps:

providing a hollow mold shell defining the exterior contours of the doll head;

introducing an amount of heat curable plastic through an opening in said hollow mold shell;

closing said mold shell by means of a mold cap over said opening, said mold cap including an elongated plug portion extending across the interior of said mold shell to form an interior mold partition;

rotating and heating the assembled mold shell and mold cap to cause the plastic to blanket the interior surfaces of the mold shell and plug portion and to cure the plastic onto said surfaces to maintain the shape of the mold and forming two closed cavities between the mold shell and plug portion; and

forming apertures in the head to provide fluid communication between said reservoir and the exterior of the head.

4,101,620
PROCESS FOR PRODUCING A PLASTIC SHEET HAVING PARALLEL RIBS EXTRUDING FROM BOTH SURFACES

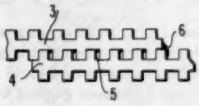
Friedrich Kops, Cologne; Helmut Kaufmann, Troisdorf, and Karl-Heinz Schymetzko, Luisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,487, Oct. 28, 1971, abandoned. This application Aug. 7, 1974, Ser. No. 495,432

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1970, 2054029

Int. Cl.² B29F *3/08*

U.S. Cl. 264—177 R **45 Claims**



1. A process for producing an unstretched bilaterally corrugated plastic sheet having a plurality of longitudinally extending parallel ribs on both sides thereof comprising extruding in a horizontal plane a plastic synthetic resin composition from a slotted nozzle which is fashioned to be comb-like on both sides thereof to form an extruded sheet having longitudinally extending parallel ribs on both sides thereof heated to an extrusion temperature, drawing off the extruded heated sheet in the longitudinal direction of the ribs from said slotted nozzle by conducting the sheet through a cooled smoothing calender, and cooling the extruded sheet within said calender to a temperature below the extrusion temperature to thereby form said unstretched bilaterally corrugated plastic sheet, said extruded sheet being drawn off from said nozzle at a fixed rate which is the same as or slightly more than the extrusion rate from said nozzle so that the ribs on said unstretched bilaterally corrugated plastic sheet exiting from said smoothing calender are uniform in size and shape, the height and width of the ribs being from about 1/15 to about equal to the thickness of a basic, non-ribbed, portion of the sheet and the basic, non-ribbed, portion of the sheet having a thickness of about 0.5 to 3 mm.

4,101,621
METHOD FOR PRODUCING FLAME RESISTANT ACRYLIC FIBERS

Toshihiro Yamamoto; Yoshioki Okubo, both of Hofu; Kenichi Toyoda, Ube, and Ryuji Yamamoto, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed May 20, 1976, Ser. No. 688,259

Claims priority, application Japan, May 31, 1975, 50/65873; Feb. 28, 1976, 51/21662

Int. Cl.² D01F *6/38*; C08F *259/04, 259/06, 265/08*

U.S. Cl. 264—182 **14 Claims**

1. A method for producing flame-resistant acrylic fibers, which comprises the steps of:

1. prior to starting solution polymerization, adding to
   (a) a solution of monomers dissolved in dimethylformamide, wherein said monomers consist essentially of from 30 to 80% by weight of acrylonitrile, from 20 to 70% by weight of vinyl chloride or vinylidene chloride and from 0 to 15% by weight of other unsaturated monomer,
   (b) from 0.1 to 10% by weight, based on the weight of (a), of a polymer consisting essentially of from 10 to 85% by weight of acrylonitrile, from 10 to 50% by weight of vinyl chloride or vinylidene chloride and from 5 to 40% by weight of an anionic monomer, and
   (c) from 0.005 to 5.0% by weight, based on the weight of (a), of zinc salt of an aromatic sulfonic acid, whereby to form a polymerization mixture,
2. then polymerizing said polymerization mixture under solution polymerization conditions to polymerize the monomers of component (a),
3. then removing unreacted monomers from the product of step 2 to obtain a polymer solution,
4. then adding from 0.005 to 3.0% by weight, based on the weight of said polymer solution, of sulfur dioxide, and adding water so that the water content of said polymer solution is from 3.0 to 15% by weight whereby to form a spinning solution, and
5. then spinning said spinning solution into an aqueous solution of dimethylformamide to form fibers.

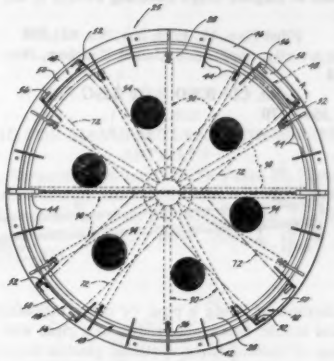
4,101,622
METHOD OF CASTING BEVELED PIPE

Frank M. Wells, Aztec, N. Mex., and Gordon J. Black, Nuevo, Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Continuation of Ser. No. 488,545, Jul. 15, 1974, abandoned, which is a division of Ser. No. 385,189, Aug. 2, 1973, Pat. No. 3,856,453. This application Dec. 30, 1975, Ser. No. 645,382

Int. Cl.² B28B *1/14*

U.S. Cl. 264—251 **13 Claims**



1. A method of casting a beveled concrete pipe in a pipe mold which includes a cylindrical outer mold case, and an inner cylinder disposed concentrically inside the outer mold case to form an annular mold cavity into which concrete is to be poured, the method comprising the steps of:
   (a) mounting the pipe mold so its axis is in an upright position;
   (b) mounting above the annular mold cavity a facing ring having a generally flat bottom surface and a plurality of spaced apart openings which together occupy a minor portion of the facing ring area, the facing ring being mounted in a plane inclined from normal to the upright axis of the pipe mold, the openings in the facing ring being located at least on low, intermediate, and high points of said inclined plane, the facing ring having a plurality of spaced apart doors for opening and closing respective openings in the facing ring;
   (c) mounting above the facing ring a plurality of pouring chutes each extending to a corresponding opening in the facing ring;
   (d) pouring concrete through the pouring chutes and the openings in the facing ring and into the annular mold cavity and distributing the concrete in the mold cavity unitl the level of the concrete reaches the vicinity of the facing ring bottom surface;
   (e) thereafter sequentially blocking further passage of concrete from the pouring chutes to the mold cavity to progressively block the rise of concrete in the mold cavity

from the low side to the high side of the facing ring, and sequentially closing the doors in the facing ring, from the low side to the high side thereof, as the passage of concrete to the mold cavity is being progressively blocked, the bottom surface of each door being substantially flush with the flat bottom surface of the facing ring when each door is closed, the bottom surfaces of the closed doors cooperating with the facing ring bottom surface so that the rising concrete distributed in the pipe mold will come into contact substantially with the entire bottom surface of the facing ring and the bottom surfaces of the closed doors and form a smooth beveled end surface of the cast pipe; and

(f) removing the pouring chutes and the facing ring from the pipe mold.

4,101,623

METHOD OF LINING PIPES

John David Webster; Anthony Austin Wilkinson, both of St. Austell, England, and Frederick George Tucker, Tennille, Ga., assignors to English Clays Lovering Pochin & Co. Ltd., England

Filed Nov. 11, 1975, Ser. No. 631,095

Claims priority, application United Kingdom, Nov. 21, 1974, 50586/74

Int. Cl.[2] B29D *9/00;* **B29G** *7/00*

U.S. Cl. 264—270 **9 Claims**

1. A method of lining a pipe, or other tubular or hollow cylindrical article, herein referred to as a pipe, with a permanent lining of thermosetting synthetic plastics material which can be introduced into a pipe in the form of a liquid mixture of prepolymer and curing agent, which mixture is capable of setting to a resilient solid material, the method comprising arranging the pipe with its longitudinal axis inclined at a predetermined acute angle to the horizontal, introducing the liquid mixture at a predetermined rate into an upper part of the pipe whereby the liquid mixture which is first introduced into the pipe flows along the inside wall of the pipe and the mixture is distributed along a length of pipe, the liquid mixture being introduced into the pipe for a predetermined time, shifting the pipe to a horizontal position, and spinning the pipe about its longitudinal axis to distribute the liquid mixture around the inside of the wall of the pipe, spinning being continued until the plastics material has set, and wherein, after spinning has started thereby to obtain an initial distribution of the material around the inside of the pipe, gas at a temperature higher than the prevailing temperature of the lining material is blown axially through the pipe for a relatively short period of time to cause entrained air bubbles in the liquid material to be removed, said pipe being fitted with a flange at each end and covers being fitted to the flanges, each said cover having a hole centrally located therein and the hole in the cover at the downstream end of the pipe, relative to the blowing direction of the hot gas, being larger than the hole in the cover at the end through which the gas blast is introduced, said pipe being shifted to its horizontal position after approximately 4/5th to 9/10th has elapsed of the predetermined time for introducing the liquid mixture into the pipe at the predetermined rate.

4,101,624

METHOD OF CASTING SILICON

Harlan B. Johnson, Rittman; Aleksandrs Martinsons, Wadsworth, and Cletus N. Welch, Clinton, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1974, Ser. No. 448,589

Int. Cl.[2] C04B *35/60*

U.S. Cl. 264—273 **4 Claims**

1. A method of casting a metal selected from the group consisting of silicon and silicon alloys containing in excess of 95 percent silicon, said metal having volumetric expansion upon solidification, comprising:

placing a hollow body containing one or more voids in a mold, said body being spaced from the interior surfaces of said mold and having a void volume of from about 1.0 to about 10.0 volume percent of the casting, basis the molten silicon;

pouring said metal in a molten state into said mold and around said hollow body disposed in said mold; and

cooling said molten metal in said mold below the melting point thereof, until pressure exerted by expansion of the cooling solid metal on the molten metal in the interior of said casting forces said molten metal into the voids of said hollow body until the voids of said hollow body are substantially filled with silicon.

4,101,625

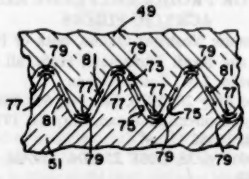
METHOD FOR MAKING CORRUGATED MOLECULARLY ORIENTED PLASTIC STRAPPING

Harold A. Haley, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 10, 1977, Ser. No. 758,211

Int. Cl.[2] B29C *24/00*

U.S. Cl. 264—287 **15 Claims**



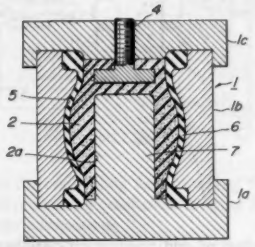
1. A method of making a molecularly oriented thermoplastic strapping including the steps of providing successive longitudinal portions of a band formed of essentially unoriented thermoplastic polymeric material with a like transverse cross-section which is of corrugated configuration and is of generally uniform thickness, in which polymer molecules thereof are oriented transversely of such band, and thereafter elongating said band without destroying the corrugated configuration thereof to also orient polymer molecules longitudinally of said band whereby the longitudinal orientation of polymer molecules in the resulting strapping imparts high tensile strength thereto and the transverse orientation of polymer molecules provides the said strapping with good resistance to longitudinal splitting.

4,101,626

METHOD FOR MOLDING AN ARTICLE EXPANDED AT THE CENTER PORTION AND HAVING THE MAXIMUM INNER DIAMETER AT SAID PORTION FOR A LIQUID ELASTOMER

Takuya Takahashi, Odawara, and Masashi Ishigami, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 603,981, Aug. 12, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,175
Claims priority, application Japan, Aug. 24, 1974, 49-96639
Int. Cl.[2] B29C *1/12*
U.S. Cl. 264—313 6 Claims



1. A method for molding an article expanded at the center portion and having the maximum inner diameter from a liquid elastomer, comprising; constituting a mold having a cover mold threadedly engaged with an upwardly tapered female screw member, a screw rod provided in the bottom end of an elastic core having the same outer shape as the inner shape of the article with the maximum diameter of the core at the expanded portion of the article provided with a hollow portion extending to at least the position of the article which has the maximum diameter, from the top end of the core, a main mold having the same shaped inner surface as the outer shape of the article expanded at the center portion and a bottom mold provided with a projection detachably fitting in the above described hollow portion in the core; assembling of the cover mold, the elastic core, the main mold and the bottom mold including inserting the porjection into the hollow portion of the core constituting a cavity corresponding to the shape of the article to be shaped, before setting the cover mold; pouring a liquid elastomer into the constituted cavity to fully fill the cavity; setting the cover mold on the main mold; hardening the poured elastomer; pulling out the bottom mold together with the projection fitted in the hollow portion in the core; removing the cover mold from the core; pulling out the core from the main mold by elastic deformation of the elastic core so as to be deformed into the hollow portion in the core and, pulling out the shaped article having the maximum diameter at the center portion.

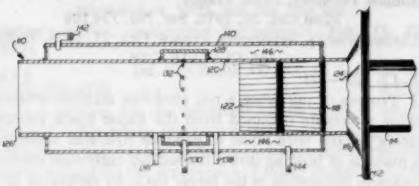
4,101,627

METHOD OF FORMING PAPER PRODUCTS

Vincent J. Menier, Pepper Pike, Ohio, assignor to North American Systems, Inc., Bedford Heights, Ohio

Filed Aug. 2, 1976, Ser. No. 710,400
Int. Cl.[2] B31D *5/02*
U.S. Cl. 264—323 3 Claims

1. In a method of continuously producing a dish-shaped filter by forming multi-layered paper sheet stock into nested groups of the desired dish-shaped filter, forcing the nested groups of the dish-shaped filter through a heat-setting tube in sequential fashion so that a plurality of nested groups of the dish-shaped filter are simultaneously present in said heat-setting tube, and simultaneously heating the plurality of nested groups of the dish-shaped filter being forced through said heat-setting tube sufficiently to maintain its shape upon removal from the heatsetting tube, the improvement whereby the heating is performed with minimized burning or scorching of the nested groups of the dish-shaped filter by supplying steam into the interior of the heat-setting tube to act as a lubricant and protector of the nested groups of the dish-shaped filter and into a steam tube surrounding the heat-setting tube,



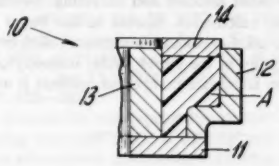
said steam tube surrounding said heat-setting tube extending for substantially the whole length of the heat-setting tube and containing supply and return lines for circulation of the steam through the steam tube.

4,101,628

METHOD FOR MANUFACTURING THERMOPLASTIC ARTICLES

Tor Wiik, Vestervik Stromsvik, 65290 Vaasa 29, Finland

Continuation of Ser. No. 515,816, Oct. 18, 1974, abandoned. This application Aug. 27, 1976, Ser. No. 718,159
Int. Cl.[2] B29F *5/00*
U.S. Cl. 264—325 1 Claim



1. A method for manufacturing objects of thermoplastic material comprising the steps of providing an extruded blank of thermoplastic material from which an object is to be formed, placing said extruded blank while still in a substantially molten state within a mold cavity defined on all sides thereof by a plurality of rigid walls totally enclosing said mold cavity, with at least one of said walls being movable relative to the other of said walls, said at least one movable wall extending substantially completely over the entire area of the side of said mold cavity defined by said at least one movable wall, displacing said at least one movable wall inwardly of said mold cavity to apply pressure to said blank along the side thereof contiguous with the side of said mold cavity defined by said at least one movable wall, said pressure being thereby applied over substantially the entire area of said contiguous side of said blank, applying heat directly to said at least one movable wall simultaneously with said displacing thereof thereby to simultaneously apply to said contiguous side of said blank heat together with the pressure resulting from said displacing of said at least one movable wall, and cooling the other sides of said blank at the same time that said pressure and said heat are being simultaneously applied to said contiguous side.

4,101,629

PURIFICATION OF SOLUTIONS CIRCULATING IN THE BAYER CYCLE

Henri Mercier; Robert Magrone, both of Gardanne, and Jean Deabriges, Aix-en-Provence, all of France, assignors to Aluminium Pechiney, Lyon, France

Filed Oct. 20, 1976, Ser. No. 734,188
Claims priority, application France, Oct. 21, 1975, 75 32169
Int. Cl.[2] C01F *7/06*
U.S. Cl. 423—121 3 Claims

1. Process of purifying a red mud-free alkaline solution of sodium aluminate obtained from the Bayer cycle process of treating bauxite with alkali to produce hydrated alumina, for the purpose of holding down the sodium carbonate content of solution in circulation in the Bayer cycle by removing impurities in the form of barium carbonate and barium oxalate comprising withdrawing at any point in the Bayer cycle, alkaline sodium aluminate solution containing an amount of sodium carbonate at least equal to the amount which was in solution during the Bayer cycle, adding a recycled quantity of a barium aluminate compound which is less than the quantity corresponding to the complete precipitation of the sodium carbonate in the form of barium carbonate, separating the precipitated barium carbonate from the sodium aluminate solution, now of reduced sodium carbonate concentration, reintroducing the latter sodium aluminate solution into the Bayer cycle, calcining the barium carbonate precipitate in the presence of added alumina, thereby removing carbon dioxide and obtaining a calcined material of essentially barium aluminate, separating the calcinate of barium aluminate into two fractions, mixing a first fraction with a solution of sodium aluminate containing sodium oxalate, being hydrate wash water previously served to scrub the aluminum hydrate of the Bayer cycle and taken therefrom, this fraction containing an amount of barium greater than the amount corresponding to the carbonate and oxalate to be removed, thus forming a precipitate and a solution with the excess barium dissolved therein, separating the precipitate and adding the same to the barium carbonate being calcined, mixing the separated solution having excess barium therein with the other fraction and recycling the compound resulting from the calcination mixture in the Bayer cycle in order to treat the alkaline sodium aluminate solution which is removed at any point in the Bayer cycle, whereby consumption of the barium aluminate compound reactant is avoided.

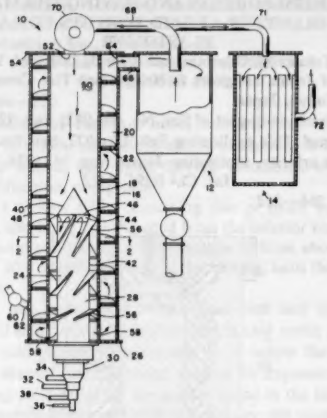
4,101,630

CONTINUOUS CALCINING OF GYPSUM

Rodney A. Stiling, Snyder, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Division of Ser. No. 719,935, Sep. 2, 1976, Pat. No. 4,052,149.
This application Jul. 14, 1977, Ser. No. 815,707
Int. Cl.[2] C04B *11/02*
U.S. Cl. 423—171 5 Claims

1. The method of calcining calcium sulfate dihydrate of a fineness of about 90% through 100 mesh to form a calcium sulfate hemihydrate comprising the steps of conducting recycled gases downwardly around the outer surface of a combustion chamber, heating additional gases within said combustion chamber, combining said additional gases with said recycled gases, guiding said combination of gases to a spiral calcination zone which is disposed radially outward of said combustion chamber, combining and uniformly mixing said calcium sulfate dihydrate with said combination of gases as said combination of gases starts to flow spirally upwardly through said calcination zone, maintaining said uniform mixture in combination as said combination flows through said calcination zone, uniformly transferring heat from said heated gases to all of said calcium sulfate dihydrate, removing said combination of gases and solids therein at the top of said calcination zone, separating the calcined solids from said gases, and recycling said gases to



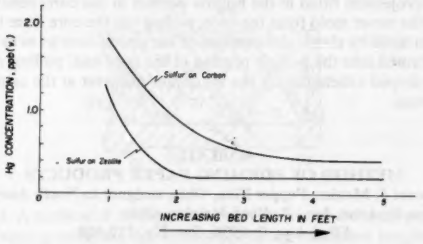
the outer surface of said combustion chamber for use in another calcining cycle.

4,101,631

SELECTIVE ADSORPTION OF MERCURY FROM GAS STREAMS

Ronald Frank Ambrosini, Scarsdale; Richard Alan Anderson, Katonah, both of N.Y.; Louis Leonard Fornoff, Cedar Grove, N.J., and Krishan Dayal Manchanda, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,529
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 8 Claims



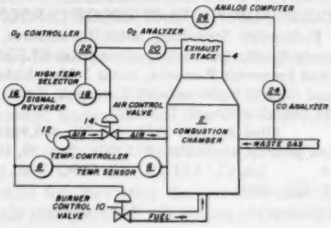
1. Process for removing mercury vapor from gas streams which comprises providing a gas stream containing water vapor and at least 0.02 micrograms of mercury vapor per normal cubic meter, passing said gas stream at a temperature of from −40° to 100° C. through a sorption zone containing a crystalline zeolitic molecular sieve having a SiO_2/Al_2O_3 molar ratio of from 2 to 20, and having elemental sulfur loaded thereon in an amount of at least 0.5 weight percent, based on the anhydrous weight of the molecular sieve, whereby mercury is adsorbed from said gas stream, and recovering the mercury-depleted effluent gas stream from said sorption zone.

4,101,632

WASTE GAS INCINERATION CONTROL

Thomas G. Lamberti, and Harry B. Rowe, both of Palestine, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 28, 1976, Ser. No. 736,480
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 5 Claims



1. A process for controlling the amount of air to be mixed with waste gas containing combustibles being fed into a combustion chamber comprising:

maintaining a chamber temperature greater than the combustion temperature of the combustible in the waste gas;

introducing a continuously fluctuating volume of waste gas containing a continuously fluctuating percentage concentration of combustibles into the combustion chamber;

measuring the percentage of combustibles in the waste gas;

computing the optimum percentage of free oxygen in the gas exhausting the chamber based on the percentage of combustibles in the waste gas;

measuring the actual percentage of free oxygen in the exhaust gas directly exhausted from the combustion chamber; and

adjusting the volume of air flow into the chamber so as to produce the optimum percentage of free oxygen in the exhaust gas.

4,101,633

PROCESS AND COMPOSITION FOR REMOVING CARBON DIOXIDE CONTAINING ACIDIC GASES FROM GASEOUS MIXTURES

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 14, 1977, Ser. No. 768,421
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—228 16 Claims

1. A process for the removal of carbon dioxide containing acidic gases from a normally gaseous mixture, which comprises:

(a) contacting said normally gaseous mixture with an aqueous amine solution comprising at least about 50 mol % of a sterically hindered amino alcohol and at least about 10 mol % of a tertiary amino alcohol, wherein said sterically hindered amino alcohol contains at least one secondary amino group which is part of a ring and is attached to either a secondary or tertiary carbon atom or a primary amino group attached to a tertiary carbon atom; and

(b) desorbing at least a portion of the absorbed carbon dioxide containing acidic gases from said solution.

4,101,634

PROCESS FOR THE SIMULTANEOUS REMOVAL OF NITROGEN AND SULFUR OXIDES FROM A GAS STREAM

Johannes E. G. Ploeg, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 4, 1977, Ser. No. 765,709
Claims priority, application Netherlands, Feb. 11, 1976, 7601371
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 5 Claims

1. In a process for the simultaneous removal of nitrogen oxides and sulfur oxides from a gas stream containing oxygen, in addition to said oxides, in which process a metal-containing acceptor is used for the acceptance of sulfur oxides in the form of a metal sulfate and ammonia precursor is added to the gas stream for the reduction of the nitrogen oxides to nitrogen, and the metal sulfate-containing acceptor is regenerated at regular intervals by stopping the flow of the gas stream and introducing a reducing gas, the improvement comprising regenerating the acceptor by contacting the acceptor with the reducing gas in a flow counter-current to the direction in which the gas stream to be purified contacts the acceptor, the regeneration being terminated when at least part of the acceptor is still in the metal sulfate form, after which the flow of the oxygen-containing gas stream to be purified is continued.

4,101,635

METHOD FOR REGENERATING AND RECYCLING CATALYST FOR OXIDATION OF SULFUR DIOXIDE

Masao Nambu; Syunichi Yamamoto, both of Kawasaki, and Yoshihisa Koiwai, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Continuation of Ser. No. 504,746, Sep. 10, 1974, abandoned. This application Feb. 28, 1977, Ser. No. 772,951
Claims priority, application Japan, Sep. 14, 1973, 48-103242; Oct. 5, 1973, 48-111538; Aug. 27, 1974, 49-97487
Int. Cl.[2] C01B *17/00;* C01F *11/46*
U.S. Cl. 423—242 10 Claims

1. A process for removing sulfur dioxide from a gas stream containing the same prior to passing said gas stream to the ambient atmosphere comprising oxidizing the sulfur dioxide with an oxygen-containing gas in a low temperature, liquid phase catalytic reaction to produce sulfuric acid wherein said reaction between sulfur dioxide and oxygen is carried out in the presence of an acidic aqueous solution containing, as oxidation catalyst, at least 3ppm each of pentavalent vanadium ion and divalent manganese ion and regenerating and recycling the oxidation catalyst by the steps of:

adding at least one calcium compound selected from the group consisting of calcium oxide, calcium hydroxide and calcium carbonate and an oxygen-containing gas as an oxidizing agent to at least a part of the aqueous catalyst solution used in the oxidation reaction and containing sulfuric acid to thereby oxidize tetravalent vanadium contained therein to pentavalent vanadium and convert sulfuric acid to gypsum, by first adding the calcium compound to the aqueous catalyst solution and thereafter adding the oxygen-containing gas to the aqueous catalyst solution wherein the amount of calcium compound added is sufficient to maintain the pH of the aqueous catalyst solution at at least 7.0,

separating the resulting gypsum, and

recycling the recovered aqueous solution catalyst for use in the oxidation of sulfur dioxide.

4,101,636
DEFLUORINATED PHOSPHATE ROCK PROCESS USING LIME

Harold V. Larson, and Morris E. Clark, both of Pasadena, Tex., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 21, 1977, Ser. No. 761,049
Int. Cl.[2] C01B *15/16, 25/26;* C05B *13/00*
U.S. Cl. 423—305 **17 Claims**

1. A process for preparing defluorinated phosphate rock from a fluorine-containing phosphate rock having an acid insoluble content in the range from in excess of 6 to about 10 percent by weight, which comprises:

(a) admixing lime with phosphoric acid in a proportion to provide a CaO to P_2O_5 weight ratio in the range from about 0.01:1 to about 0.2:1 in the resulting acid slurry,

(b) admixing said acid slurry with said phosphate rock, soda ash and water to form a mixture containing a CaO to P_2O_5 weight ratio in the range from about 1.010:1 to about 1.058:1,

(c) granulating the resulting mixture to form granules,

(d) heating said granules to dryness,

(e) heating the resulting dried granules without fusion to a temperature sufficient to defluorinate said phosphate rock, whereby sufficient fluorine is evolved to produce defluorinated phosphate rock granules.

4,101,637
DIRECT GRANULATION PROCESS FOR TRIPLE SUPERPHOSPHATE

Laurence William Bierman, and Gary Lynn Long, both of Pocatello, Id., assignors to J. R. Simplot Company, Boise, Id.

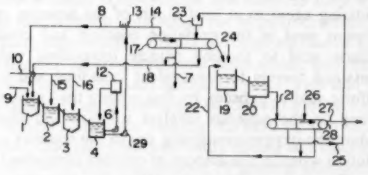
Filed Oct. 29, 1975, Ser. No. 626,772
Int. Cl.[2] C01B *15/16, 25/26*
U.S. Cl. 423—309 **4 Claims**

1. In a process for the production of monocalcium phosphate by reaction of phosphoric acid and a material selected from the group consisting of lime, limestone and dolomite, the improvement which comprises: (1) adding said material to a dilute dispersed solution of phosphoric acid containing 22–38% P_2O_5 by weight with vigorous agitation while maintaining a temperature of 100°–180° F for a minimum of 3–5 minutes to produce a directly granulatable slurry; (2) granulating the resulting slurry; (3) drying the resultant granulated slurry at a temperature not exceeding 200° F; and (4) recovering the resultant dried and granulated monocalcium phosphate.

4,101,638
PROCESS FOR THE MANUFACTURE OF A SLURRY CONTAINING HIGHLY CONCENTRATED PHOSPHORIC ACID AND CALCIUM SULFATE HEMIHYDRATE IN A READILY FILTERABLE FORM

Takasuke Inoue; Yuzo Itoh; Sataro Nakajima; Shin-Ichi Tajika, and Yoshio Saiki, all of Fuchu, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,741
Claims priority, application Japan, Aug. 13, 1975, 50-098305
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 **6 Claims**



1. In a wet process for the manufacture of highly concentrated phosphoric acid, which process comprises a digestion step in which phosphate rock is digested by phosphoric acid and sulphuric acid to produce a slurry containing phosphoric acid having a P_2O_5 concentration in excess of 40%, together with calcium sulfate hemihydrate and a separation step in which the slurry is filtered to separate said calcium sulfate hemihydrate from said highly concentrated phosphoric acid, the improvement which comprises the step of introducing active silica during the digestion step.

4,101,639
PROCESS FOR PRODUCTION OF CARBON BLACK

Vitaly Fedorovich Surovikin, ulitsa Lermontova, 20, kv. 80; Gennady Vasilievich Sazhin, ulitsa 501et VLKSM, 8, kv. 33; Mikhail Ivanovich Romanov, ulitsa 3 Molodezhnaya, 56, kv. 34, and Nikolai Kalistratovich Korenyak, Kamerny pereulok, 52, kv. 39, all of Omsk, U.S.S.R.

Filed Jun. 23, 1976, Ser. No. 698,911
Claims priority, application U.S.S.R., Jun. 30, 1975, 2150406
Int. Cl.[2] C01B *31/02;* C09C *1/48*
U.S. Cl. 423—449 **3 Claims**

1. A plasmatron process for the production of carbon black comprising:

(a) introducing a gaseous heat carrier in the form of a plasma stream into a reaction chamber at a temperature of 2000° to 5000° K;

(b) contacting the plasma stream with water vapor prior to contacting with a feedstock, said water vapor being introduced radially and tangentially with respect to the walls of the reaction chamber wherein the radial and tangential amounts of water vapor vary in a ratio of at least 3:1 respectively;

(c) contacting the plasma stream in the reaction chamber with a hydrocarbon feedstock saturated with water vapor, introduced at a distance of not less than 5 diameters of the reaction chamber from the point of introduction of the water vapor into said plasma stream;

(d) cooling the reaction products resulting from the thermal decomposition of the feedstock to a temperature of about 200° to 700° C; and

(e) recovering the product.

4,101,640
PRODUCTION OF OH_3^+ SALTS

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 767,010, Feb. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 625,398, Oct. 24, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,786
Int. Cl.[2] C01B *7/00*
U.S. Cl. 423—462 **3 Claims**

1. A composition of matter consisting of an OH_3^+ cation, and an anion consisting of the hexafluoride of a material selected from the group consisting of antimony and arsenic.

4,101,641
PROCESS FOR THE REMOVAL OF SULPHUR OXIDES FROM GASES

Ian Poll, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1977, Ser. No. 801,262
Claims priority, application Netherlands, May 28, 1976, 7605736
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—567 R **5 Claims**

1. In a process for the removal of sulphur oxides from a gas with the aid of a solid acceptor which accepts the sulphur oxides, the loaded acceptor subsequently being regenerated with reducing gas, and in which elemental sulphur is prepared from the regeneration offgas containing sulphur compounds, the improvement comprising preparing the elemental sulphur by feeding the regeneration offgas to a generator for the reduc-

ing gas in which a fuel is partially combusted with the sulphur compounds and oxygen to form a reducing gas containing hydrogen, carbon monoxide, and elemental sulphur, after which the sulphur is recovered from the reducing gas, and the reducing gas is used for the regeneration of the loaded acceptor.

4,101,642

METHOD FOR CONVERTING THE AMMONIA AND HYDROGEN SULFIDE CONTAINED IN COKE-OVEN GASES INTO NITROGEN AND WATER AND SULFUR RESPECTIVELY

Kurt Tippmer, Recklinghausen, Germany, assignor to Firma Carl Still, Germany

Filed Aug. 11, 1976, Ser. No. 713,494

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537451

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—573 G **4 Claims**

1. A method for converting the ammonia and hydrogen sulfide in coke oven gases into water, nitrogen and sulfur using waste gases from which ammonia and hydrogen sulfide have been removed, comprising mixing said coke oven gases with oxygen enriched gas and a first portion of 80 to 90% of the waste gases, burning said mixture and passing the resulting gaseous products over a catalyst to convert the ammonia into water and nitrogen, mixing these gases which have passed over the catalyst with oxygen enriched gas and a second portion of the waste gases, cooling the mixture and removing some of the condensed sulfur, further processing the gases which have some of the sulfur removed to remove additional sulfur to form a remaining product gas, condensing the water from said remaining product gas, and using a portion of the resulting gaseous products to form a part of the waste gases, 80 to 90% of said oxygen enriched gas being added in said first mentioned mixture and 10 to 20% is added in said second mentioned mixture.

4,101,643

PROCESS FOR RECOVERING SULFUR BY REMOVAL OF SULFUR DIOXIDE FROM GASEOUS MIXTURES

Shao E. Tung, 91 Blake Rd., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 499,582, Apr. 21, 1974, Pat. No. 3,984,529. This application Sep. 30, 1976, Ser. No. 728,174

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—575 **27 Claims**

1. A process for removing sulfur dioxide from gaseous mixtures comprising:

contacting the gaseous mixture in a scrubbing zone with a removal reactant consisting essentially of an aqueous solution of an alkali metal sulfite to form an aqueous solution of an alkali metal hydrosulfite salt;

contacting, in a transfer reaction zone, the aqueous solution of said hydrosulfite salt with an organic liquid phase which includes at least one nitrogen-containing organic compound which does not form a stable emulsion with water, and which is selected from the group consisting of aliphatic amines containing from about 8 to about 45 carbon atoms, and having a solubility in water of less than 0.2 gm/100 gms water at 25° C, to yield, by a transfer reaction, an organic liquid phase containing at least one sulfur-containing salt of said nitrogen compound, and to concurrently regenerate said removal reactant;

separating the organic liquid phase containing said sulfur-containing nitrogen compound from the aqueous solution; then

heating the organic liquid phase to a temperature of at least 70° C to decompose the sulfur-containing salts to yield sulfur dioxide and regenerate said nitrogen-containing compound.

4,101,644

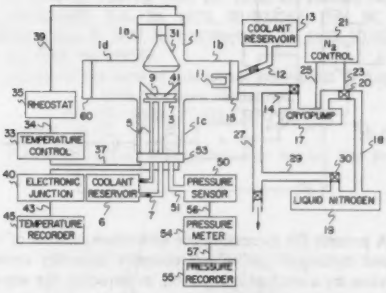
PROCESS FOR THE PREPARATION OF CALCIUM SUPEROXIDE

Robert A. Frosch, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of; E. Vernon Ballou, Santa Clara, Calif.; Peter C. Wood, San Jose, Calif.; Theordore J. Wydeven, Jr., Sunnyvale, Calif., and LeRoy A. Spitze, Morgan Hill, Calif.

Filed Jul. 11, 1977, Ser. No. 814,378

Int. Cl.[2] C01B *15/043*

U.S. Cl. 423—581 **11 Claims**



1. A process for converting calcium peroxide diperoxyhydrate to calcium superoxide which comprises:

(a) washing the calcium peroxide diperoxyhydrate with a dry polar solvent to obtain finely divided diperoxyhydrate;

(b) spreading a thin layer of the finely divided washed diperoxyhydrate on the surface of a flat container over an area within the range of about 18 to about 300 cm^2 per gram;

(c) positioning said container on a support structure in a reaction chamber;

(d) partially evacuating said chamber to a pressure not greater than about 500 μm Hg;

(e) allowing said diperoxyhydrate to reach a temperature not greater than about 40° C;

(f) while maintaining said temperature, rapidly and systematically removing from the diperoxyhydrate zone the heat and water vapor released by the conversion of said compound;

(g) backfilling the chamber with a dry inert gas; and

(h) recovering the calcium superoxide produced.

10. A process for converting calcium peroxide diperoxyhydrate to a calcium superoxide which comprises:

(a) spreading a thin layer of finely divided calcium peroxide diperoxyhydrate on a flat porous support in a chamber over an area within the range of 145 to 300 cm^2 per gram;

(b) partially evacuating said chamber to a background pressure lower than 20 μm Hg;

(c) allowing said diperoxyhydrate to reach a temperature not greater than 40° C;

(d) while maintaining said temperature and keeping the chamber pressure at a level not greater than about 90 μm, passing a flow of cool dry inert gas through said porous support and diperoxyhydrate layer to sweep away evolved water and heat towards a liquid nitrogen cooled surface;

(e) backfilling said chamber with nitrogen gas, after completion of the reaction; and

(f) recovering the calcium superoxide produced.

4,101,645

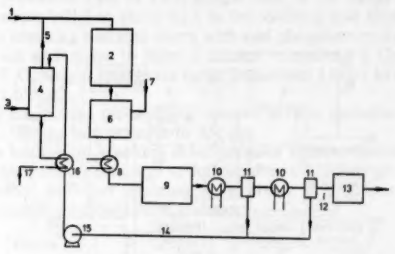
PROCESS FOR THE PRODUCTION OF HYDROGEN/DEUTERIUM-CONTAINING GAS

Eberhard Nitschke, Do-Barop; Arvind Desai, Dortmund-Aplerbeck, and Hartmut Ilgner, Dortmund, all of Fed. Rep. of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 611,611, Sep. 9, 1977, abandoned, which is a division of Ser. No. 352,606, Apr. 19, 1973, Pat. No. 3,957,961. This application Nov. 8, 1976, Ser. No. 739,638

Int. Cl.[2] C01B *4/00, 1/16, 5/02, 31/20*

U.S. Cl. 423—648 A **3 Claims**



1. A process for increasing the deuterium content of manufactured hydrogen gas which contains naturally occurring deuterium by a method comprising in sequence the steps of:

I. reacting naphtha with steam in a first cracking furnace to produce a partially cracked process gas which consists of carbon monoxide, water vapor, hydrogen and lower hydrocarbons and insuring that enough steam is introduced to have water vapor which is 0.6 kg/m^3 of the process gas;

II. introducing the partially cracked process gas into a second cracking furnace;

III. introducing air into the second cracking furnace;

IV. cracking the lower hydrocarbons of the partially cracked process gas to produce a fully cracked process gas;

V. cooling the fully cracked process gas which consists of carbon monoxide, water vapor and hydrogen in a heat exchanger;

VI. passing the fully cracked process gas into a carbon monoxide converter;

VII. introducing steam into a carbon monoxide converter to convert the carbon monoxide to carbon dioxide and thereby having a modified process gas consisting of carbon dioxide, water vapor and hydrogen;

VIII. cooling the modified process gas in a heat exchanger;

IX. passing the modified gas through a separator to divide the phases, the condensate which is liquid water with some carbon dioxide and impurities dissolved in it from the less humid gas which is carbon dioxide, hydrogen and traces of water vapor;

X. conducting the liquid condensate via a booster pump through a heat exchanger for cooling;

XI. introducing the liquid condensate into the top of an exchange column;

XII. introducing steam into the bottom of the exchange column;

XIII. contacting the liquid condensate with the steam in the exchange column to achieve an equilibrium of concentration of deuterium, the deuterium in the liquid water transfers to the steam which enriches the steam in deuterium and depletes the water;

XIV. conveying the steam rich in deuterium to Step I;

XV. conducting the less humid gas from Step IX to a carbon dioxide scrubbing unit;

XVI. removing the carbon dioxide in the scrubbing unit from the less humid gas leaving manufactured hydrogen gas rich in naturally occurring deuterium.

4,101,646

FERRITE VASCULAR CONTRAST MEDIA

Mitsuo Sugimoto, Tokyo, Japan, assignor to Rikagaku Kenkyusho, Japan

Continuation-in-part of Ser. No. 46,913, Jun. 17, 1970, abandoned. This application May 10, 1972, Ser. No. 252,519 Claims priority, application Japan, May 13, 1970, 45-40656

Int. Cl.[2] A61K *29/02*

U.S. Cl. 424—4 **4 Claims**

1. A water dispersible composition for the preparation of a vascular radiographic contrast media, said composition comprising 20 to 50 parts by weight of at least one magnetic ferrite having a particle size of from about 0.05 to about 1 μ coated with from 80 to 50 parts by weight of a negatively charged colloid selected from the group consisting of colloidal gold, colloidal silver iodide, colloidal platinum and colloidal silicate.

4,101,647

ORAL DOSAGE FORM FOR X-RAY CONTRAST MEDIA CONTAINING A PHARMACEUTICALLY ACCEPTABLE BASE AND METHOD OF USE THEREOF

Wolfram Clauss; Ulrich Speck, and Dietmar Jentsch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,333

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1975, 2505218

Int. Cl.[2] A61K *29/02*

U.S. Cl. 424—5 **17 Claims**

1. In a pharmaceutical composition adapted for oral administration, comprising in unit dosage form, an X-ray contrast agent for cholecystocholangiography in admixture with a pharmaceutically-acceptable carrier, the improvement wherein the composition comprises an amount per unit dosage of a pharmaceutically-acceptable base effective to neutralize the stomach acid content of a human when the composition is ingested.

4,101,648

COMPOSITION FOR CARRYING OUT A URIC ACID LOAD TEST

Horst Ulbrich, Merenberg, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Bad Homburg, Fed. Rep. of Germany

Filed Aug. 23, 1976, Ser. No. 716,549

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537488

Int. Cl.[2] A61K *29/00, 31/52;* **G01N** *33/16*

U.S. Cl. 424—9 **2 Claims**

1. A composition for carrying out a uric acid load test comprising a mixture consisting essentially of adenine and guanine in about equal quantities by weight incorporated in amorphous silicic acid as a carrier therefor.

4,101,649

HYDROSOLUBLE AGENTS HAVING NON SPECIFIC IMMUNODEPRESSIVE PROPERTIES

Arlette Adam, nee Chosson, Palaiseau; Pierre LeFrancier, Bures-sur-Yvette, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 8, 1976, Ser. No. 730,839

Claims priority, application France, Oct. 9, 1975, 75 30948

Int. Cl.[2] A61K *39/00, 37/00;* **C07C** *103/52*

U.S. Cl. 424—12 **26 Claims**

1. N-acetylmuramyl-D-alanyl-D-isoglutamine which possesses immunosuppressive or immunodepressive properties.

15. A diagnostic composition for diagnosis and inhibition of the action of an adjuvant comprising a compound selected from the group consisting of: N-acetylmuramyl-D-alanyl-D-isoglutamine and N-acetylmuramyl-L-alanyl-L-isoglutamine and a compatible carrier.

4,101,650

PEPSTATIN FLOATING MINICAPSULES

Hamao Umezawa, Tokyo, Japan, assignor to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,268
Int. Cl.[2] A61K *9/46, 9/50, 37/64*
U.S. Cl. 424—44 15 Claims

1. A composition in oral dosage form comprising minicapsules having a diameter in the range of 0.1 to 2 mm. in which the center comprises a granule of sodium bicarbonate, said granule being coated with a conventional water-soluble, film-coating agent and said center being coated with pepstatin.

4,101,651

PROCESS FOR PREPARING PREPARATIONS FOR ORAL ADMINISTRATION

Toshiyuki Kobayashi, Yokohama; Akio Okada, Kawasaki; Takeshi Mayama, Chigasaki, and Akira Okada, Zushi, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 655,026
Claims priority, application Japan, Sep. 29, 1975, 50-117513
Int. Cl.[2] A61K *9/16, 31/74, 31/78*
U.S. Cl. 424—35 4 Claims

1. A process for preparing granular preparations for oral administration having no bitter taste which comprises dissolving a pharmaceutically acceptable water insoluble ethyl cellulose as a bitter taste-masking substance having a molecular weight higher than about 2,000 in high concentration in a volatile solvent to be used for dissolving or suspending midecamycin as a bitter pharmaceutical ingredient, adding the midecamycin to the resulting solution followed by kneading, adding silicic acid anhydride to the resulting kneaded substance to form a powder and granulating said powder using a solution of the ethyl cellulose in a fluidized bed granulator, said volatile solvent not exerting a degrading effect upon said ethyl cellulose or upon said midecamycin, the amount of said ethyl cellulose to be dissolved in said solvent being about 0.5 to about three times the amount of said midecamycin and the amount of said ethyl cellulose used for said granulation being about 1/10 to about 1/5 the amount thereof used for said dissolving.

4,101,652

PHARMACEUTICALLY ACTIVE COMPLEXES AND PHARMACEUTICAL COMPOSITIONS CONTAINING EASCIN AND STEROLS

Attilio Bonati, Milan, Italy, assignor to Inverni Della Beffa S.p.A., Milan, Italy

Filed Jun. 14, 1976, Ser. No. 695,752
Claims priority, application United Kingdom, Jul. 1, 1975, 27707/75
Int. Cl.[2] A61K *31/705;* C07J *17/00*
U.S. Cl. 424—49 19 Claims

1. A pharmaceutical composition comprising a pharmaceutically acceptable diluent or carrier and as active ingredient an effective amount of a complex formed between aescin and a sterol selected from the group consisting of cholesterol, β-sitosterol, stigmasterol, campesterol and mixtures thereof, the aescin being in free acid form or in the form of a pharmaceutically acceptable salt, with the proviso that where the composition is an unpurified aqueous suspension of a complex formed between cholesterol and the impure sodium or potassium forms of aescin, the composition contains an ingredient selected from the group consisting of preservatives and buffering, thickening, suspending, stabilizing, wetting, emulsifying, coloring and flavoring agents.

11. A composition according to claim 1 in the form of a dentifrice.

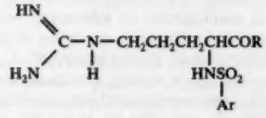
4,101,653

N[2]-ARYLSULFONYL-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Tokyo; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Tokyo; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

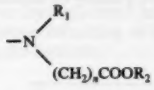
Continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, and Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, and Ser. No. 703,704, Jul. 8, 1976, said Ser. No. 671, 436, and said Ser. No. 671,568, each is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,929
Claims priority, application Japan, Nov. 8, 1974, 49/128774; Nov. 8, 1974, 49/128775; Nov. 29, 1974, 49/136695; Nov. 29, 1974, 49/136697; Feb. 25, 1975, 50/023268; Feb. 26, 1975, 50/023635; Mar. 5, 1975, 50/026768; Mar. 11, 1975, 50/029357; Mar. 11, 1975, 50/029358
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 13 Claims

1. An N[2]-arylsulfonyl-L-argininamide having the formula (I):



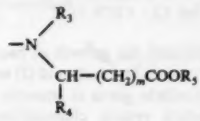
(I)

or a pharmaceutically acceptable salt thereof, wherein R is



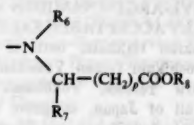
(1)

wherein R_1 is C_3–C_{10} alkylcarbonylalkyl, ring substituted aralkyl wherein said substituent is C_1–C_5 alkoxy or C_1–C_5 alkyl, 2-thenyl, 3-thenyl, or a tetrahydrofurfuryl or tetrahydro-3furylmethyl group either of which is substituted with one or more C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, or tetrahydro-2-thenyl, tetrahydro-3-thenyl, tetrahydro-2(3 or 4)-pyranylmethyl or 1,4-dioxa-2-cyclohexylmethyl which is unsubstituted or substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof; R_2 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and n is 1, 2, or 3;

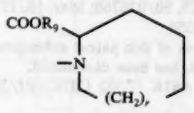


(2)

wherein R_3 is C_3–C_{10} alkylcarbonylalkyl, 2-thenyl, 3-thenyl, or a tetrahydrofurfuryl or tetrahydro-3-furylmethyl group either of which is substituted with one or more C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, a tetrahydro-2-thenyl, tetrahydro-3-thenyl, tetrahydro-2(3 or 4)-nyranylmethyl or 1,4-dioxa-2-cyclohexylmethyl group which is unsubstituted or substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof; R_4 is C_1–C_{10} alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl optionally substituted with one or more C_1–C_5 alkyl or C_1–C_5 alkoxy groups, C_7–C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_5 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and m is 0, 1 or 2;


(3)

wherein R_6 is furfuryl, 3-furylmethyl, tetrahydrofurfuryl or tetrahydro-3-furylmethyl; R_7 is carboxy, C_2–C_{10} alkoxycarbonyl, phenyl optionally substituted with one or more C_1–C_5 alkyl or C_1–C_5 alkoxy groups, C_7–C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_8 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *p* is 0, 1 or 2; or


(4)

optionally substituted with one or more C_1–C_5 alkyl, alkoxy or mixtures thereof, wherein R_9 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and r is 1, 2, 3 or 4; Ar is phenyl, which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof.

4,101,654

MICROBIOCIDAL PROCESS EMPLOYING FULL QUATERNARY NITROGEN-HETEROCYCLIC PHOSPHONATES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 380,606, Jul. 19, 1973, abandoned, which is a division of Ser. No. 117,082, Feb. 19, 1971, Pat. No. 3,770,750. This application Apr. 4, 1977, Ser. No. 784,385

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 **9 Claims**

1. A process of inhibiting the growth of bacteria from the group consisting of (1) aerobic bacteria and (2) sulfate reducing bacteria of the Desulfovibrio genus in aqueous, hydrocarbon, or aqueous hydrocarbon system characterized by adding thereto a growth inhibiting amount of a quaternary full nitrogen-heterocyclic phosphonate wherein the nitrogen-heterocyclic group is selected from the group consisting of pyridine, the picolines, the lutidines, the collidines, cyano-pyridine, quinoline and isoquinoline, each having an unsaturated bond between the nitrogen atom and one adjacent carbon atom and a saturated bond between the nitrogen atom and the other adjacent carbon atom, the phosphorus atom of the phosphonate group being bonded directly to a carbon atom of said nitrogen-heterocyclic group, said phosphonate group being ortho or para to the nitrogen atom in said nitrogen-heterocyclic group and the quaternary group is an alkyl or phenyl halide, sulfate or alkyl sulfate with the proviso that the said alkyl moiety in both occurrences contains 1–12 carbon atoms.

4,101,655

INSECTICIDAL AND OVICIDAL METHOD

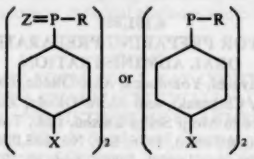
Edwin L. Sukman, Montclair, N.J., assignor to M & T Chemicals Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 555,884, Mar. 6, 1975, Pat. No. 3,989,824. This application Oct. 4, 1976, Ser. No. 729,029

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—204 **7 Claims**

1. A method for killing insects and sterilizing their eggs by applying to said insects, eggs or to substrates susceptible to infestation with said insects an insecticidally and ovicidally effective amount of a phosphorus compound exhibiting the formula:



wherein R is selected from the group consisting of alkyl and haloalkyl radicals containing between 1 and 12 carbon atoms, X represents a halogen atom selected from the group consisting of fluorine, chlorine, bromine and iodine and Z represents oxygen or sulfur.

4,101,656

7β-ACYLAMINO-3-(ALKANESULFONAMIDOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL) CEPHALOSPORINS, ANTIBACTERIAL COMPOSITIONS CONTAINING THEM AND METHODS OF TREATING BACTERIAL INFECTIONS WITH THEM

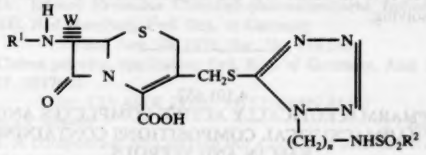
David A. Berges, Wayne, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Filed Jul. 12, 1976, Ser. No. 704,141

Int. Cl.[2] A61K *31/545;* **C07D** *501/54, 501/56*

U.S. Cl. 424—246 **30 Claims**

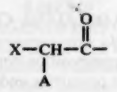
1. A compound of the formula:



in which:

W is hydrogen or methoxy;

R^1 is an acyl group of the formula:



where:

X is thienyl, phenyl or phenyl monosubstituted with hydroxy, hydroxymethyl, formamido or ureido;

A is NH_2, OH, COOH, SO_3H or formyloxy;

n is two to five; and

R^2 is alkyl of from one to four carbon atoms, or a non-toxic pharmaceutically acceptable salt thereof.

23. An antibacterial pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

26. A method of treating bacterial infections comprising administering internally by injection to an infected or suscepti-

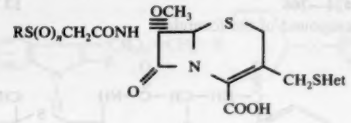
ble warm-blooded animal an antibacterially effective but non-toxic dose of a compound as claimed in claim 1.

4,101,657
CEPHAMYCINS AS ANTIBACTERIAL AGENTS

Robert M. DeMarinis, King of Prussia, Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 540,482, Jan. 13, 1975, Pat. No. 4,059,578, which is a continuation-in-part of Ser. No. 504,619, Sep. 9, 1974, abandoned. This application Jul. 1, 1977, Ser. No. 812,012
Int. Cl.[2] A61K *31/545*
U.S. Cl. 424—246 **14 Claims**

1. A method of treating bacterial infections comprising administering to a warm-blooded animal an antibacterially effective but non-toxic dose of 250–1000 mg of a compound of the formula



wherein

R is CF_3 or CF_3CH_2;

n is 0, 1 or 2; and

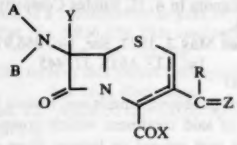
Het is tetrazolyl, triazolyl, thiadiazolyl or oxadiazolyl, each unsubstituted or substituted with one or two alkyl groups of 1–4 carbon atoms or a pharmaceutically acceptable salt thereof and a pharmaceutical carrier therefor.

4,101,658
ANTIBACTERIAL HYDRAZONO CEPHALOSPORINS

Mitsuru Yoshioka, Toyonaka; Yuji Sendo, Nishinomiya; Koji Ishikura, Amagasaki; Masayuki Murakami, Itami, and Sadao Miyazaki, Toyonaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jun. 4, 1975, Ser. No. 583,696
Int. Cl.[2] A61K *31/545;* **C07D** *501/20*
U.S. Cl. 424—246 **7 Claims**

1. A compound of the following formula:



wherein A is hydrogen;

B is thienylacetyl;

R is hydrogen;

X is hydroxy;

Y is hydrogen or methoxy; and

Z is a hydrazion moiety selected from the group consisting of:

(1) hydrazono;

(2) 2-(o- or p-carboxyphenyl)hydrazono, 2-(p-alkylsulfonylphenyl)hydrazono in which said alkyl contains 1 to 3 carbon atoms,

2-(p-sulfophenyl)hydrazono which can form a slat with an alkali metal ion;

(3) 2-phenyl-2-alkylhydrazono in which the alkyl contains 1 to 3 carbon atoms;

(4) 2-(2-pyridyl)hydrazono, 2-(thiazol-2-yl)hydrazono, 2-(1-amino-5-mercapto-1,3,5-triazol-2-yl)hydrazono, 2-(purin-6-yl)-hydrazono, 2-(4-oxoimidazolin-2-yl)hydrazono;

(5) 2-(sulfolan-3-yl)hydrazono, 2-(carbalkoxymethyl)hydrazono in which the carbalkoxy contains 2 to 5 carbon atoms;

(6) (4-methylpyrazin-1-yl)imino, (2-pyridon-1-yl)imino;

(7) 2-(alkanoyl)hydrazono in which the alkanoyl contains 1 to 4 carbon atoms, 2-glycylhydrazono, 2-(n-tertiary butoxycarbonyl-glycyl)hydrazono, 2-(trimethylammoniumacetyl)hydrazono, 2-(pyridiniumacetyl)hydrazono, 2-oxalylhydrazono, 2-(alkoxalyl)hydrazono in which the alkoxalyl contains 3 to 6 carbon atoms, 2-(amidoxalyl)hydrazono, 2-(hydrazinyldicarbonyl)hydrazono, 2-(cyaboacetyl)hydrazono, 2-(gluconoyl)hydrazono, 2-(benzoyl)hydrazono, 2-(furoyl)hydrazono, 2-(isoxazol-3-yl)carbonylhydrazono, 2-(5-methyl-isoxazol-3-yl)carbonylhydrazono, 2-(1,2,5-thiadiazol-3-yl)-carbonylhydrazono, 2-(5-methyl-1,2,3-thiadiazol-4-yl)carbonylhydrazono;

(8) 2-(carbalkoxy)hydrazono in which the carbalkoxy contains 2 to 5 carbon atoms, 2-(dithiocarbalkoxy)hydrazono in which the dithiocaralkoxy contains 2 to 5 carbon atoms, 2-(methylthiothiocarbonyl) hydrazono and 2-(4-hydroxyimidazol-2-yl)hydrazono; and wherein the broken line shows the presence of a double bond at the 3-position, or an alkali metal salt thereof.

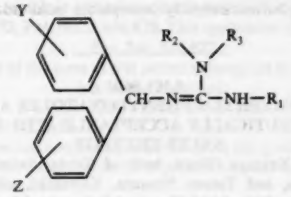
4. An antibacterial pharmaceutical composition comprising an effective antibacterial amount of the compond of claim 1, and a pharmaceutically acceptable carrier.

4,101,659
BENZHYDRYL GUANIDINES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed Aug. 29, 1977, Ser. No. 828,694
Int. Cl.[2] C07D *295/12;* **A61K** *31/535*
U.S. Cl. 424—248.56 **23 Claims**

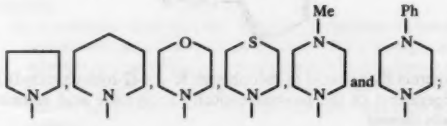
1. A pharmaceutical composition in dosage unit form comprising an effective hypoglycemic amount of a member selected from the group consisting of a benzhydryl guanidine derivative having the formula:



wherein:

R_1 is a member selected from the group consisting of hydrogen and loweralkyl;

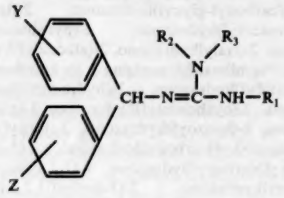
taken together represents a member selected from the group consisting of



and Y and Z are each a member selected from the group consisting of hydrogen, halo, loweralkyl, and loweralkyloxy;

and the pharmaceutically acceptable acid salts thereof in admixture with a pharmaceutical carrier.

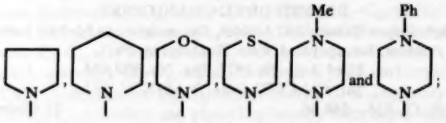
15. A compound selected from the group consisting of a benzhydryl guanidine derivative having the formula:



wherein:

R_1 is a member selected from the group consisting of hydrogen and loweralkyl;

taken together represents a member selected from the group consisting of



and Y and Z are each a member selected from the group consisting of hydrogen, halo, loweralkyl, and loweralkyloxy;

and the pharmaceutically acceptable acid addition salts thereof.

4,101,660

2-AMINOMETHYL-5-PHENYLOXAZOLES AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Sho Inoue; Katsuya Ohata, both of Kyoto; Satoshi Tsutsui, Yokohama, and Tatsuo Nomura, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Nippon Shinyaku Company, Limited, Kyoto, both of, Japan

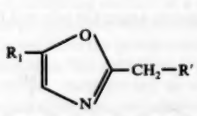
Filed Feb. 9, 1977, Ser. No. 766,975

Claims priority, application Japan, Feb. 12, 1976, 51-14194; Feb. 26, 1976, 51-20328

Int. Cl.[2] **A61K** *31/495;* **C07D** *413/06*

U.S. Cl. 424—250 **5 Claims**

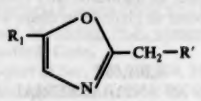
1. A 2-aminomethyl-5-phenyloxazole having the formula (I):



(I)

wherein R_1 is phenyl or halophenyl; R′ is 4-(2-hydroxyethyl)-1-piperazinyl or the pharmaceutically acceptable acid addition salts thereof.

4. A method of meliorating inflammation in warm blooded animals, which comprises administering to said animal an anti-inflammatory effective amount of a compound having the formula (I):



(I)

wherein R_1 is phenyl or halophenyl; R′ is 4-(2-hydroxyethyl)-1-piperazinyl.

4,101,661

NOVEL ANTIBACTERIAL AMIDE COMPOUNDS AND PROCESS MEANS FOR PRODUCING THE SAME

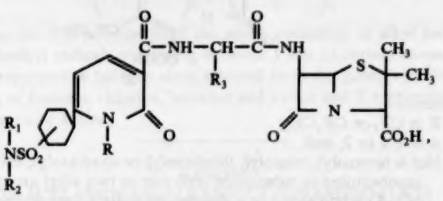
James S. Kaltenbronn; Theodore H. Haskell, and Leonard Doub, all of Ann Arbor, Mich., assignors to Warner-Lambert, Morris Plains, N.J.

Filed Jun. 3, 1977, Ser. No. 803,004

Int. Cl.[2] **C07D** *499/68;* **A61K** *31/43, 31/455*

U.S. Cl. 424—266 **13 Claims**

1. A compound of the formula



and pharmaceutically-acceptable salts thereof; wherein R is hydrogen or methyl; R_1 is hydrogen, lower alkyl or hydroxy(-lower alkyl), R_2 is hydrogen, lower alkyl, hydroxy(lower alkyl), pyridyl or di(lower alkyl)amino(lower alkyl); R_1R_2N taken together is 1-pyrrolidinyl, 1-piperidinyl or hydroxymethyl-1-piperidinyl, R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl.

4,101,662

METHOD FOR INHIBITING EMESIS AND COMPOSITIONS THEREFOR

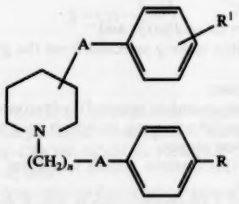
John Wesley Ward, and Charles Arthur Leonard, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed May 3, 1973, Ser. No. 356,975

Int. Cl.[2] **A61K** *31/445*

U.S. Cl. 424—267 **8 Claims**

1. A method of inhibiting emesis and nausea in an animal or human in need of said treatment which comprises internally administering to said animal or human from about one half milligram to about five milligrams of a compound selected from 1,4-(3-)-disubstituted piperidines of the formula:



wherein;

R is halogen having an atomic weight less than 80,

R^1 is selected from the group consisting of hydrogen and halogen having an atomic weight less than 80,

n is a positive integer from 2–4 inclusive,

A is selected from the group consisting of —C(O)— and —CHOH—, and

pharmaceutically acceptable acid addition salts thereof.

4,101,663

BENZOYLPIPERIDYLALKYLINDOLES

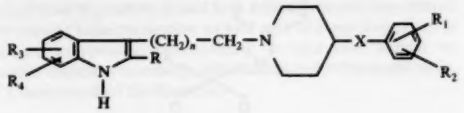
Grover C. Helsley, Pottersville; Joseph T. Strupczewski, Flemington, and Beth Ann Gardner, Stanhope, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 663,820, Mar. 4, 1976, Pat. No. 4,046,900, which is a continuation-in-part of Ser. No. 594,042, Jul. 8, 1975, abandoned. This application Jun. 21, 1977, Ser. No. 808,451

Int. Cl.[2] C07D *401/06*

U.S. Cl. 424—267 1 Claim

1. A method of treating hypertension which comprises administering to a patient a pharmaceutically effective amount of a compound of the formula



wherein X is

or CHOH; R is hydrogen or methyl; R_1 and R_2 are the same or different and stand for hydrogen, halogen, straight or branched chain alkyl of up to 5 carbon atoms, alkoxy of up to 5 carbon atoms, trifluoromethyl, hydroxy, phenoxy or phenyl; R_3 and R_4 are hydrogen or methoxy; *n* is the integer 1 or 2; or an acid addition salt thereof prepared from a pharmaceutically acceptable acid.

4,101,664

1-(2-AR-4-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YLMETHYL)-IMIDAZOLES

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

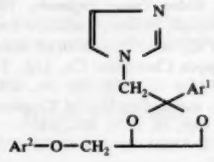
Continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Oct. 15, 1976, Ser. No. 732,828

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.[2] A61K *31/33;* C07D *405/06*

U.S. Cl. 424—273 R 4 Claims

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:

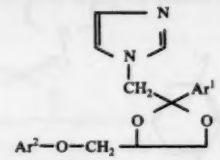


and the therapeutically acceptable acid addition salts thereof, wherein:

Ar^1 is a member selected from the group consisting of naphthalenyl, thienyl, halothienyl, nitrophenyl, cyanophenyl, lower alkyl-halophenyl and lower alkyloxy-halophenyl; and

Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, phenyl and phenylmethyl.

4. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically active acid addition salts and stereochemical optical isomeric forms thereof, wherein:

Ar^1 is a member selected from the group consisting of naphthalenyl, thienyl, halothienyl, nitrophenyl, cyanophenyl, lower alkylhalophenyl and lower alkyloxy-halophenyl; and

Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, phenyl and phenylmethyl.

4,101,665

1-(2-AR-4-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YLMETHYL)IMIDAZOLES

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

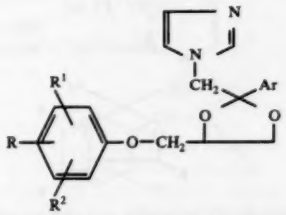
Continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Oct. 15, 1976, Ser. No. 732,827

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.[2] A61K *31/33;* C07D *405/06*

U.S. Cl. 424—273 R 6 Claims

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically acceptable acid addition salts thereof, wherein:

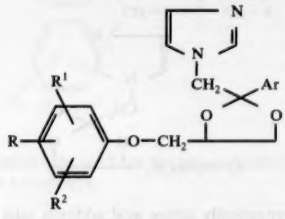
Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano;

R is a member selected from the group consisting of nitro, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl; and

R^1 and R^2 are each independently selected from the group

consisting of hydrogen, halo, lower alkyl and lower alkyloxy.

6. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically active acid addition salts and stereochemical optical isomers thereof, wherein;

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano;

R is a member selected from the group consisting of nitro, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl; and

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and lower alkyloxy.

4,101,666

1-(2-AR-4-R-1,3-DIOXOLAN-2-YLMETHYL)IMIDAZOLES

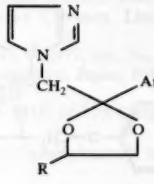
Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Oct. 15, 1976, Ser. No. 732,826

Int. Cl.[2] **C07D** *405/06;* **A61K** *31/33*

U.S. Cl. 424—273 R **12 Claims**

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:

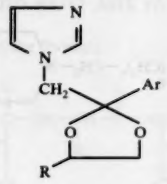


and the therapeutically acceptable acid addition salts and stereochemical optical isomeric forms thereof, wherein:

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano; and

R is a member selected from the group consisting of alkyloxymethyl wherein the alkylgroup has from 1 to 10 carbon atoms, alkenyl, alkenyloxymethyl, wherein said alkenyl has from 2 to 10 carbon atoms, hydroxymethyl, 2-propynyloxymethyl, halomethyl, arylmethyl and arylmethoxymethyl, wherein said aryl is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and mono- and di-halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro, phenyl, phenylmethyl, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl, provided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of phenyl, phenylmethyl, benzoyl and halobenzoyl.

7. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an amidazole derivative having the formula



and the therapeutically active acid addition salts and stereochemical optical isomeric forms thereof, wherein:

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano; and

R is a member selected from the group consisting of alkyloxymethyl wherein the alkylgroup has from 1 to 10 carbon atoms, alkenyl, alkenyloxymethyl, wherein said alkenyl has from 2 to 10 carbon atoms, hydroxymethyl, 2-propynyloxymethyl, halomethyl, arylmethyl and arylmethoxymethyl, wherein said aryl is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and mono- and di-halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro, phenyl, phenylmethyl, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl, provided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of phenyl, phenylmethyl, benzoyl and halobenzoyl.

4,101,667

BENZO[B,F]THIEPIN DERIVATIVES

Shigeru Yamabe, Kobe; Yasuo Fujimoto, Tokyo; Shoji Ryu, Noda; Yoshio Suzuki, Misato; Yoshihiro Tanaka, Soka; Toru Yamanaka, and Kiyosato Nyu, both of Misato, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

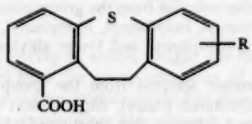
Filed May 25, 1976, Ser. No. 689,908

Claims priority, application United Kingdom, May 30, 1975, 23703/75; Japan, Oct. 28, 1975, 50-129490

Int. Cl.[2] **A61K** *31/38, 31/495;* **C07D** *337/14, 409/10*

U.S. Cl. 424—275 **16 Claims**

1. A compound of the following formula:



wherein R represents a hydrogen or fluorine atom, a trifluoromethyl, 1-5C lower alkoxy, hydroxy, hydroxyethoxy or aminoethoxy group, or the group of the formula —OCH_2C-$H_2OCH_2CH_2OH$.

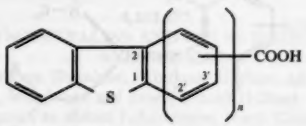
4,101,668

ANTIOSTEOPOROTIC AGENTS

Carlos M. Samour, Wellesley, Mass., and Julius A. Vida, Greenwich, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 10, 1977, Ser. No. 795,570
Int. Cl.[2] A61K *31/38*
U.S. Cl. 424—275 10 Claims

1. A process for the treatment of a host animal in order to modify the balance between the rate of bone resorption and the rate of bone deposition in said host animal whereby the ratio of said rate of bone resorption to said rate of bone deposition is reduced comprising administering to said host animal an amount sufficient to modify said balance and reduce said ratio, of a compound of the formula:



wherein *n* has a value of 0 or 1; provided that there is a COOH substituent at the 1, 2, 2' or 3' position relative to the S group; and further provided that when *n* is 0, the carboxyl group is attached to the ring containing the S group; or a nontoxic, pharmaceutically acceptable salt thereof.

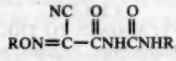
4,101,669

STABILIZED FORMULATIONS OF 2-ALKOXYIMINO-N-CARBAMOYL-2-CYANOACETAMIDES

Frederic John Baude, and Willis Eli Cupery, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 639,581, Dec. 12, 1975, Pat. No. 4,053,612, which is a continuation-in-part of Ser. No. 545,605, Jan. 30, 1975, abandoned. This application Aug. 25, 1977, Ser. No. 827,595
Int. Cl.[2] A01N *9/02, 9/12, 9/20*
U.S. Cl. 424—286 3 Claims

1. A fungicidal composition consisting essentially of
(a) 10 parts of a compound of the formula



wherein
R is methyl or ethyl, and
R_1 is hydrogen, alkyl of 1–4 carbon atoms or allyl;
(b) a fungicidally effective amount of zineb; and
(c) from 1 to 100 parts of an acidulent having a pH of 2 to 5.7 in a 1% distilled water mixture and a free acidity of from 2.5 millimoles per gram to 22 millimoles per gram of acidulent when titrated in a 1% distilled water mixture to a pH of 7.

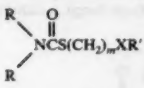
4,101,670

GERMICIDAL AND ACARICIDAL COMPOSITIONS

Kunihiko Fujimori; Kuniaki Shimizu, both of Shimizu, and Haruki Ogawa, Fujieda, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,861
Claims priority, application Japan, Aug. 15, 1975, 50-99144
Int. Cl.[2] C07C *153/09;* A01N *9/12*
U.S. Cl. 424—300 10 Claims

7. A method for controlling fungi, or mites which comprises applying germicidally or acaricidally effective amount of the thiolcarbamate derivative having the general formula



wherein R represents a lower alkyl group; R' represents a group shown by the formula

wherein Y represents a halogen atom, an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, a nitro group, a methylthio group, or a trifluoromethyl group, and n is an integer of 0 to 3, a benzyl group, a methylbenzyl group, or a naphthyl group; X represents an oxygen atom or a sulfur atom; and m is an integer of 3 to 6.

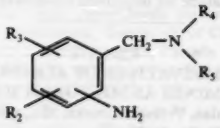
4,101,671

AMINOBENZYL-AMINES AND SALTS THEREOF

Johannes Keck, Biberach, Riss; Klaus-Reinhold Noll, Warthausen-Oberhofen; Helmut Pieper, Biberach, Riss; Gerd Krüger, Biberach, Riss, and Sigfrid Püschmann, Biberach, Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 649,482, Jan. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 458,099, Apr. 5, 1974, Pat. No. 3,950,393. This application Mar. 24, 1977, Ser. No. 780,903
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1973, 2318636; Jan. 23, 1974, 2402989
Int. Cl.[2] C07C *87/28*
U.S. Cl. 424—330 7 Claims

1. A compound of the formula



wherein
R_2 is hydrogen, chlorine or bromine;
R_3 is alkyl of 1 to 4 carbon atoms; and
R_4 and R_5 are each alkyl of 1 to 5 carbon atoms or cycloalkyl of 5 to 7 carbon atoms;
or a non-toxic, pharmacologically acceptable acid addition salt thereof.

6. The method of preventing ulcers in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective anti-ulcerogenic amount of a compound of claim 1.

4,101,672

MICROBICIDAL ALANINE THIOESTERS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

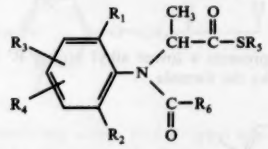
Filed Sep. 22, 1976, Ser. No. 725,203

Claims priority, application Switzerland, Sep. 30, 1975, 12647/75

Int. Cl.² A01N 9/12; C07C 153/11, 161/02

U.S. Cl. 424—301 20 Claims

11. A method for protecting plants from phytopathogenic fungi which comprises applying to growing plants, to soil in which plants are to be grown or to seeds of the plants, in an amount sufficient to protect the plants from fungi, a compound of the formula



wherein

R_1 represents methyl or methoxy,

R_2 represents methyl, ethyl, chlorine or bromine,

R_3 represents hydrogen, methyl or halogen,

R_4 represents hydrogen or methyl,

R_5 represents methyl or ethyl, and

R_6 represents hydrogen, C_2 or C_3 alkyl, C_1–C_3 alkyl substituted by cyano or thiocyano, C_2 or C_3 alkyl substituted by halogen, C_2–C_4 alkenyl, C_2–C_4 alkenyl substituted by halogen, C_2–C_4 alkynyl or C_3–C_7 cycloalkyl.

4,101,673

PURIFICATION OF NUTRITIVE OILS

Stephen S. Chang, East Brunswick, N.J., assignor to Vitrum AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 498,568, Aug. 19, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 745,069

Int. Cl.² A01N 9/24

U.S. Cl. 424—312 7 Claims

1. A nutritive oil-in-water emulsion suitable for parenteral administration, comprising an oil selected from the group consisting of soybean oil and sunflower oil, an emulsifier for said oil, and water wherein the improvement comprises:

contacting said nutritive oil with an adsorbant selected from the group consisting of silicic acid and silica gel, to substantially remove non-urea-adduct forming esters and unsaponifiable matter from said nutritive oil, recovering said oil from the adsorbant, and subsequently combining the recovered nutritive oil with sterile water and an emulsifier to produce an improved oil-in-water emulsion.

4,101,674

HALOGEN DERIVATIVES OF ALKYNOXYMETHYL AMINES AS MICROBIOCIDES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 556,332, Mar. 7, 1975, Pat. No. 4,026,946. This application Jan. 3, 1977, Ser. No. 756,217

Int. Cl.² A01N 9/20, 9/24

U.S. Cl. 424—325 9 Claims

1. A process of inhibiting or preventing the growth of microorganisms in aqueous or hydrocarbon systems which comprises treating said aqueous or hydrocarbon system with about 5 to 500 p.p.m. of a compound which is a halogenated alkynoxymethyl amine having the formula

$RN(CH_2OR'C{\equiv}CX)_2$

where R is alkyl, aryl or cycloalkyl, R′ is an alkylene group having up to 8 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine.

4,101,675

NOVEL 2,6-DI-SUBSTITUTED PHENYL-AMINOQUANIDINE CONTAINING COMPOSITIONS AND METHODS OF USING SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME AND THERAPEUTIC METHOD

Harm Jan Panneman, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

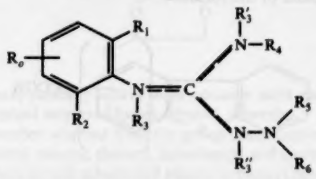
Continuation-in-part of Ser. No. 517,554, Oct. 24, 1974, Pat. No. 3,972,932. This application Jan. 29, 1976, Ser. No. 653,318

Claims priority, application Netherlands, Nov. 9, 1973, 7315350

Int. Cl.² A61K 31/155; C07C 129/08

U.S. Cl. 424—326 2 Claims

1. Method for the treatment of hypertension in hypertensive humans and warm blooded animals comprising administering to said human or animal a daily dosage of from 0.001 to 50 mg per kg body weight of a compound selected from the group consisting of a compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, in which one double bond is present between the carbon atom of the guanidino moiety and one of the adjacent nitrogen atoms, and in which

R_o is selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy containing from 1 to 6 carbon atoms, and alkyl containing from 1 to 6 carbon atoms;

R_1 and R_2 are selected from the group consisting of halogen, hydroxy, alkyl containing from 1 to 4 carbon atoms, and alkoxy containing from 1 to 4 carbon atoms;

R_3, R_3' and R_3'' are selected from the group consisting of hydrogen and alkyl containing from 1 to 4 carbon atoms, with the proviso that one of the substituents R_3, R_3', or R_3'' is absent because of the presence of the double bond;

R_4 is selected from the group consisting of hydrogen, alkyl containing from 1 to 4 carbon atoms, and amino optionally substituted with one or two alkyl groups containing from 1 to 4 carbon atoms; and

R_5 and R_6 are selected from the group consisting of hydrogen, alkyl containing from 1 to 6 carbon atoms, and acyl, with the proviso that if R_4 is methyl and R_o, R_3, R_3'', R_5 and R_6 are hydrogen, R_1 and R_2 may not represent methyl simultaneously.

4,101,676

DIPHENYLPROPYLAMINES TO TREAT DEPRESSION

Judith Ann Clark, Barrington, England, assignor to Beecham Group Limited, United Kingdom

Division of Ser. No. 443,021, Feb. 15, 1974, Pat. No. 4,028,415. This application Jun. 21, 1976, Ser. No. 698,131

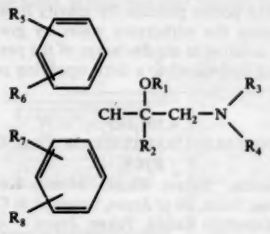
Claims priority, application United Kingdom, Feb. 24, 1973, 9183/73; Oct. 13, 1973, 47928/73

Int. Cl.² A61V 31/135; C07C 93/20

U.S. Cl. 424—330 43 Claims

22. A method of treating depression in humans which comprises administering to a human in need thereof an anti-depressantly effective amount of a pharmaceutical composition

which comprises an anti-depressantly effective amount of a compound of the formula



or a pharmaceutically acceptable salt or hydrate thereof, wherein R_1 is $CO.R_9$ wherein R_9 is alkyl of 1 to 6 carbon atoms, phenyl or benzyl; R_2 is hydrogen; R_3 is hydrogen or methyl; R_4 is methyl; R_5 is hydrogen, fluorine, chlorine, bromine, methyl, ethyl, methoxy, ethoxy, trifluoromethyl, acetoxy, nitro, amino, methylamino or dimethylamino; and R_6, R_7 and R_8 are each hydrogen, fluorine, chlorine, bromine, methyl, methoxy or trifluoromethyl; in combination with a pharmaceutically acceptable carrier.

4,101,677

AMINOTETRALINS AND USE IN INDUCING ANESTHESIA

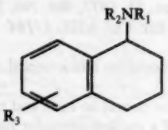
Daniel Ambrose Dunnigan, Winthrop Harbor; Adolph Oscar Geiszler, Mundelein, and James Brooks Holland, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 401,018, Sep. 26, 1973. This application Jun. 15, 1977, Ser. No. 806,790

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **3 Claims**

1. A method for inducing local anesthesia in animals which comprises locally administering to an animal to be anesthetized an anesthetically effective amount of a compound selected from the group consisting of a member of the formula:



where R_1 is selected from the group consisting of branched or straight chain alkyl of 6–9 carbon atoms and cyclohexyl, R_2 is selected from the group consisting of hydrogen, loweralkyl and loweralkanol, wherein said R_2 contains 1–3 carbon atoms, and R_3 is 5 or 6 methoxy; and nontoxic pharmaceutically acceptable acid addition salts thereof.

4,101,678

CLARIFICATION OF CITRUS JUICES

Robert A. Baker, Winter Haven, and Joseph H. Bruemmer, Tampa, both of Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 6, 1977, Ser. No. 794,597

Int. Cl.[2] A23L *2/30*

U.S. Cl. 426—50 **10 Claims**

1. A process for the clarification of citrus juices by the removal of cloud, comprising in combination the following:

(a) adding a sufficient amount of polygalacturonic acid (PGA) to citrus juice;

(b) allowing said solution to stand and cloud material to coagulate;

(c) removing the resultant coagulated cloud material thereby leaving a clear solution.

4,101,679

CELLULOSE FERMENTATION PROCESS

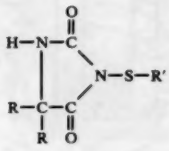
Donald L. MacFadden, Bristol, Tenn., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 31, 1977, Ser. No. 801,933

Int. Cl.[2] A23K *1/12*

U.S. Cl. 426—53 **8 Claims**

1. A method for accelerating the rate of cellulose fermentation by cellulose-digesting rumen bacterial and cecum microorganisms which comprises conducting said fermentation in the presence of a rateaccelerating amount of a compound of the formula



wherein R' is haloalkyl of 1 to 2 carbon atoms and 1 to 5 chloro or bromo groups and R individually is hydrogen or lower alkyl of 1 to 6 carbon atoms.

4,101,680

CO-CRYSTALLIZATION OF DEXTROSE AND SUCROSE ON CEREAL PRODUCTS

Larry W. Edwards, Hillsdale, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jan. 5, 1977, Ser. No. 756,931

Int. Cl.[2] A23L *1/164*

U.S. Cl. 426—96 **7 Claims**

1. A process for the co-crystallization of dextrose and sucrose onto the surface of a breakfast cereal product comprising the steps of:

(a) preparing an aqueous solution of dextrose and sucrose having a predermined ratio of dextrose to sucrose and having total sugar content of at least about 75%, by weight;

(b) coating the surface of said cereal product with a powdered seed material selected from the group consisting of anhydrous dextrose, dextrose monohydrate and sucrose;

(c) applying a thin film of said aqueous solution onto the surface of the dusted cereal product;

(d) reducing the moisture content of said thin film to not less than about 3%; and,

(e) allowing the sugars in said thin film to crystallize.

4,101,681

DEAROMATIZATION OF COFFEE OIL

Gerald S. Hurlow, Toronto; Jean R. Blain, Montreal; Michael Coombes, Pointe Claire; Jean-Claude Richard, Chateauguay, and Patrick W. Hitchinson, Dorval, all of Canada, assignors to General Foods Limited, Toronto, Canada

Filed Jan. 6, 1977, Ser. No. 757,167

Int. Cl.[2] A23F *1/08*

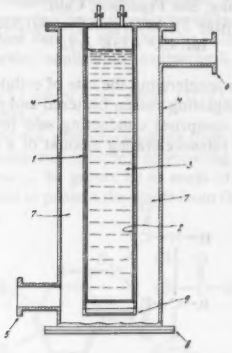
U.S. Cl. 426—387 **15 Claims**

1. A process of obtaining coffee aroma constituents useful in the aromatization of a foodstuff which comprises:

(a) subjecting coffee oil in a distillation chamber to distillation at sub-atmospheric pressures and mild temperatures to obtain aroma constituents therefrom;

(b) condensing said aroma constituents onto the outer surface of a heat-conductive sleeve removably and snugly surrounding a heat-conductive container, said container having a coolant therein and said sleeve being enclosed by a condensing chamber, said condensing chamber having ports for the passage of said aroma constituents within the space between the sleeve and the condensing chamber, and said condensing chamber having a removable cover

which seals an opening through which the sleeve is passed when removed from the container;



(c) removing said cover and taking out said sleeve with the condensed aroma constituents thereon; and

(d) recovering said condensed aroma constituents.

4,101,682

METHOD AND APPARATUS FOR STEAM PEELING PRODUCE

Paul Kunz, Deishardtstr. 3, Dottesfeld, Fed. Rep. of Germany (541)

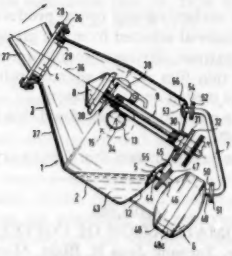
Division of Ser. No. 674,553, Apr. 7, 1976. This application Oct. 15, 1976, Ser. No. 732,820

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1975, 7511878[U]

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.[2] A23N *7/00*

U.S. Cl. 426—482 **1 Claim**



1. In a method for steam peeling produce in a pivotally mounted pressure vessel into which the produce is to be fed and subsequently peeled by steam, the improvement comprising:

(a) providing a bath of water at the bottom portion of said vessel;

(b) feeding the produce by gravity into said vessel by locating said vessel in a first loading position substantially incline to the vertical for receiving said produce;

(c) temporarily maintaining said bath of water in said vessel during feeding of the produce for receiving the fed produce in a relatively impact-free manner;

(d) after feeding the produce into said vessel, withdrawing at least a substantial portion of said water bath by gravity into a separate reservoir attached to said vessel for establishing an overall suitable steam peeling environment thereby by pivoting said vessel to a second operative position;

(e) closing said vessel and thereafter steaming the produce to peel the produce;

(f) opening said vessel and thereafter simultaneously discharging the peeled produce by gravity from said vessel and returning the withdrawn water by gravity to said vessel for assisting in the discharge of the peeled produce by pivoting said vessel to a third emptying position.

4,101,683

PROCESS FOR MANUFACTURE OF FAST COOKING RICE

Hidemoto Kamada, Tokyo; Chiaki Miura, Kawasaki, and Makoto Utena, Niiza, all of Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1976, Ser. No. 704,578

Claims priority, application Japan, Jul. 16, 1975, 50/86156

Int. Cl.[2] A23L *1/182*

U.S. Cl. 426—618 **4 Claims**

1. A process for the manufacture of fast cooking rice, consisting essentially of puffing a raw rice into a puffed rice having a volume of 6 to 16 times as large, contacting this puffed rice with a solution of a thickener in a concentration in the range from about 0.1 to about 1.0 weight percent sufficiently to penetrate to the inside center of the puffed rice, and thereafter drying the treated puffed rice to reduce the volume thereof, said thickener being selected from the group consisting of agar, carrageenin, alginate, alginic acid, locust bean gum, guar gum, tamarind gum, psyllium seed gum, quince seed gum, gaz, pectin, glucomannan, propylene glycol alginate, low methyl ester pectin, sodium polyacrylate, carboxymethylcellulose salt, methylcellulose, hydroxymethylcellulose, methylethylcellulose, hydroxypropylcellulose, xanthan gum, cardrun, scleroglucan, succinoglucan and pullulan.

4,101,684

EXTRUSION PROCESS FOR THE TREATMENT OF CEREALS

John Richard Masson, Brigstock, and Joseph Dooley, Bugbrook, both of England, assignors to Golden Wonder Limited, England

Filed Jan. 24, 1977, Ser. No. 762,438

Int. Cl.[2] A23L *1/164*

U.S. Cl. 426—625 **8 Claims**

1. An extrusion process for a raw cereal comprising the steps of:

(a) subjecting a raw cereal to heat and pressure in an extrusion chamber of a cooker extruder having a sleeve and a co-operating screw, which sleeve during operation is subject to wear which affects the density of the extrudate;

(b) adding to the raw cereal upstream of the cooker extruder an additive comprising particles of cereal which have already been expanded and milled;

(c) monitoring the density of the extrudate;

(d) utilizing the results of the monitoring to determine the amount of said additive to be added to the raw cereal upstream of extrusion so as to keep the density of the subsequent extrudate within a predetermined range; and

(e) adding the determined amount of said additive to the raw cereal to keep the density of the extrudate within said range.

4,101,685

SYSTEM FOR CONTROLLING THE MOISTURE CONTENT OF FLOCK IN A FLOCKING MACHINE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.

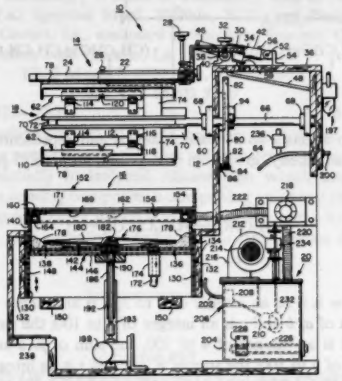
Filed Aug. 16, 1976, Ser. No. 714,800

Int. Cl.[2] B44C *1/00*

U.S. Cl. 427—8 **23 Claims**

16. An open top flock tray for holding a quantity of flock for use in applying flock to a substrate, said flock tray comprising

a floor and contiguous sidewalls, and an air duct located along the entire upper periphery of said sidewalls and defined by top, bottom and side walls, at least one inlet opening extending into



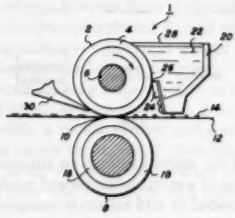
said duct and a plurality of discharge openings in the bottom wall of said duct extending from said duct into said tray for feeding a uniform flow of air of controlled humidity into said tray.

4,101,686

METHOD OF FUSING TONER IMAGES USING FUNCTIONALIZED POLYMERIC RELEASE AGENTS

Stephen Strella; Donald A. Seanor, both of Pittsford; George R. Imperial, and Thomas R. Hoffend, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 24, 1974, Ser. No. 491,415
Int. Cl.² G03G *13/20*
U.S. Cl. 427—22 **5 Claims**



1. The method of fusing non-reactive electroscopic thermoplastic resin toner images to a substrate including the steps of:

(a) forming a film on a heated, metal fuser member in an electrostatic reproducing apparatus, said film being a barrier to non-reactive electroscopic thermoplastic resin toner and comprising the product resulting from the interaction of the metal fuser member and a polydialkyl siloxane having built-in reactive functional groups selected from the group consisting of hydroxy, epoxy, amino, isocyanate, and mercapto, thereon which interact with the fuser member, said polydialkyl siloxane being fluid at the temperature between about 250° F and 400° F of the metal fuser member and acting as a release fluid film for the non-reactive electroscopic thermoplastic resin toner, the polydialkyl siloxane fluid being one capable of displacing electroscopic thermoplastic resin toner;

(b) contacting the toner images on said substrate with the coated, heated, metal fuser member for a period of time sufficient to soften the electroscopic thermoplastic resin toner; and

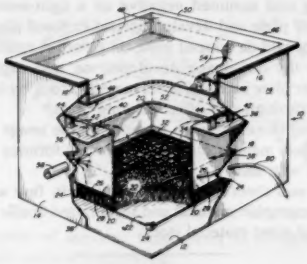
(c) allowing the toner to cool.

4,101,687

ELECTROSTATIC COATING METHOD

Walter Ganter Knudsen, Bethany, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Aug. 13, 1975, Ser. No. 604,323
Int. Cl.² B05D *1/04, 1/06;* B05B *5/00*
U.S. Cl. 427—25 **9 Claims**



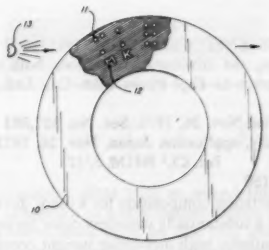
1. An electrostatic coating method comprising the steps of: generating a stream of highly ionized gas at a location spaced by at least a minimum discharge distance of about 7.5 centimeters from a porous support member, said gas having an ionization value equivalent to air passed at about 3.0 to 15.0 standard cubic feet per minute through an electrode having a maximum resistance of about 0.05 ohm per centimeter and having applied to it a voltage of about 30 to 80 kilovolts; supplying to the upper surface of said support member particulate material that is capable of acquiring an electrostatic charge; passing said highly ionized gas along a flow path and thereafter upwardly through said support member, while substantially maintaining the ionization level thereof, to fluidize and efficiently electrostatically charge the particles of said material to produce a fluidized bed thereof; and placing in proximity to said fluidized bed a workpiece having a charge effectively opposite to said particles to thereby produce a coating thereof upon said workpiece, said minimum discharge distance being such as to prevent the passage of a substantial current from the source of said ionized gas to an electrically grounded member placed upon said upper surface of said support member.

4,101,688

METHOD FOR PRINTING BRAILLE CHARACTERS BY LITHOGRAPHY

Martin E. Kurtzman, 154 Harrison Ave., Island Park, N.Y. 11558

Filed Jul. 22, 1976, Ser. No. 707,508
Int. Cl.² B41K *3/68;* B44F *1/10*
U.S. Cl. 427—56 **5 Claims**



1. A method for printing braille characters by means of a lithographic printing process, comprising the steps of:

exposing photosensitive sheet material to form a positive dot

image of one or more braille characters on said sheet material;

developing the exposed photosensitive sheet material;

photographing said developed photosensitive sheet material and making a negative of said developed sheet material;

mounting said negative on an opaque sheet and cutting apertures in said sheet to permit light to pass through said negative;

exposing said mounted negative on a light-sensitive lithographic plate and developing said exposed plate;

mounting said developed plate on an offset printing press;

printing the dot image developed on said exposed lithographic plate in ink on sheet material stock by feeding said stock through said offset printing press;

depositing thermographic material on the image printed on said sheet material stock while the ink forming said image is still wet; and

heating said sheet material stock to melt, fuse and set said thermographic material and form raised braille characters on said sheet material stock.

4,101,689

ANTISTATIC AND/OR ELECTRICALLY CONDUCTIVE FLOOR COVERING, AS WELL AS PROCESS FOR THE PRODUCTION THEREOF

Michael Wienand, Siegburg, and Ernst Juch, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 22, 1973, Ser. No. 372,528

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1972, 2230578

Int. Cl.² B05D *5/12, 3/12*

U.S. Cl. 427—122 **10 Claims**

1. A process for the production of a floor covering of a thermoplastic synthetic resin having a paste containing conductive material incorporated therein in the form of a plurality of thread-like projections connected together, which comprises heating a thermoplastic resin sheet to a temperature of between 40° and 60° C; punching holes that penetrate completely through the heated sheet; applying a paste containing a conductive material and plasticized synthetic resin to one side of the heated sheet so that the paste penetrates into the holes; and then heating the sheet to above 60° C. from the side where the paste has been applied, whereby, due to the contraction of the holes in the hotter zone, the paste is forced through to the other side of the sheet to form said thread-like projections within said holes.

4,101,690

DESENSITIZING COMPOSITION

Akio Miyamoto, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

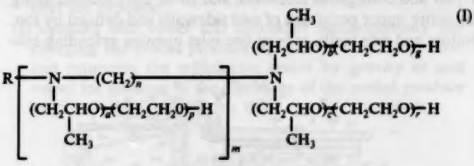
Filed Nov. 26, 1974, Ser. No. 527,383

Claims priority, application Japan, Nov. 26, 1973, 48-132331

Int. Cl.² B41M *5/12*

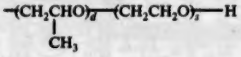
U.S. Cl. 427—150 **11 Claims**

1. In a desensitizing composition for a color developer capable of coloring a substantially colorless color former including a natural or synthetic high molecular weight compound and a pigment, the improvement which comprises said composition containing a compound obtained by reacting an amine with propylene oxide and ethylene oxide represented by the following general formula (I)



(I)

wherein R has 2 to 20 carbon atoms and represents an alkyl group, an alkenyl group, an aryl group, an aralkyl group or a



group; *m* is 0 or an integer of 1 to 3; *n* is an integer of 2 to 6; the sum of *a, b* and *c* is an integer of 3 to 100; the sum of *a, b, c* and *d* is an integer of 4 to 100; the sum of *p, q* and *r* is an integer of 3 to 100; the sum of *p, q, r* and *s* is an integer of 4 to 100 and the molar ratio of propylene oxide moieties to ethylene oxide moities is 0.2 to 20.

4,101,691

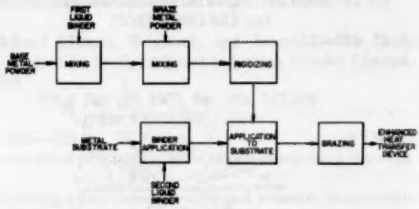
ENHANCED HEAT TRANSFER DEVICE MANUFACTURE

Robert Curtis Borchert, West Seneca, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 9, 1976, Ser. No. 721,865

Int. Cl.² B05D *3/02*

U.S. Cl. 427—229 **13 Claims**



1. A method for manufacturing an enhanced heat transfer device consisting of a metal substrate and randomly distributed metal bodies bonded to said substrate comprising the steps of:

(a) providing base metal powder with particles of major dimensions less than 0.1 inch;

(b) mixing said base metal powder with first liquid binder and in proportion such that the weight ratio of base metal powder to first liquid binder is between 20:1 and 30:1, so as to form an adherent mass;

(c) providing braze metal powder having a melting point lower than said base metal powder and with particles of major dimensions such that the major dimension ratio of braze metal powder to base metal powder is between 1:60 and 1:3, and mixing said braze metal powder and said adherent mass in weight proportion such that said braze metal powder is between 10 and 30 percent of the braze metal powder plus the base metal powder, so as to form braze metal-coated mass;

(d) applying a second liquid binder on said metal substrate;

(e) applying said braze metal-coated mass on the second liquid binder coated metal substrate; and

(f) heating the braze metal coated mass-metal substrate sufficiently to remove said first and second binders, melt said braze metal and metal bond said base metal to said metal substrate thereby forming said metal bodies.

4,101,692

METHOD FOR RAPID CURING OF PARTIALLY HYDROLYZED SILICATE FILM

Henry L. Lomasney; William J. Lomasney, both of New Orleans, La.; Ignatius Metil, Buffalo, N.Y., and Dickens M. Lagos, Gretna, La., assignors to Southern Imperial Coatings Corporation, New Orleans, La.

Filed May 27, 1977, Ser. No. 801,307
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—333 8 Claims

1. A method for top coating a partially hydrolyzed silicate film with a protective coating that will accelerate the cure rate of said partially hydrolyzed silicate film which comprises applying a coating composition comprising an epoxy resin and a curing agent, one of which is in an emulsion, and a hydraulic cement to said partially hydrolyzed inorganic silicate film.

4,101,693

METHOD OF PREPARING EPOXY-GLASS PREPREGS

Lo Kwang Tsen, Coshocton, and John Louis Palkiewicz, Nashport, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 169,463, Aug. 5, 1971, abandoned. This application Nov. 20, 1974, Ser. No. 525,419
Int. Cl.[2] B05D *3/02;* B32B *17/10*
U.S. Cl. 427—386 7 Claims

1. A method for preparing prepregs for use in the manufacture of epoxy glass circuit board substrate laminates characterized by improved antimeasling, solvent resistance and antismearing upon drilling, which comprises a) impregnating a glass fabric with an epoxy resin composition comprising a first epoxy resin of diglycidy ether of bisphenol A having an epoxy equivalent weight of 170 to 200 and an average functionality of not more than 2, and a second epoxy resin comprising the reaction product of diglycidyl ether bisphenol A epoxy resin and a polyhydric phenol selected from the group consisting of bisphenol A and tetrabromobisphenol A, said resulting second epoxy resin having an epoxy equivalent weight of 900 to 1900 and an average functionality of not more than 2, the proportions of said first resin ranging from about 30 to 60% by weight of resin solids and of said second resin from about 70 to 40% by weight of resin solids, a curing system, and a suitable solvent, and b) passing the epoxy impregnated glass fabric through an oven maintained at an elevated temperature to partially advance said epoxy resin and to remove said solvent.

4,101,694

WOOD FINISHING PROCESS

Wayne A. Kraus, 2224 Ogden Ave., Cornwells Heights, Pa. 19020

Filed Jun. 20, 1977, Ser. No. 807,974
Int. Cl.[2] B05D *7/18, 1/36, 7/16*
U.S. Cl. 427—399 7 Claims

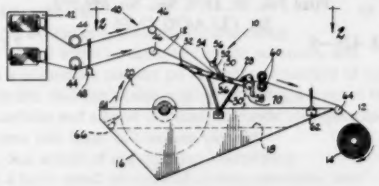
1. A process for finishing open-grain wood comprising the steps of: applying a paste filler to the wood; and thereafter applying at least one coat of lacquer, the lacquer, at least in the first coat thereof, comprising a quantity of film-forming solids dissolved in a thinner, and the filler being pervious to said thinner; characterized by the step of applying a washcoat in a substantially non-aqueous volatile solvent, preceding the application of filler, to form on the surface of the wood and within pores of the wood a film substantially insoluble in said thinner; whereby gas bubbles located within the pores are unable to rise to the surface of the wood and form blisters in the lacquer film.

4,101,695

METHOD OF COATING STRAND MATERIAL

Robert Lee Batts, Denison, Tex., assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 638,014, Dec. 5, 1975, Pat. No. 4,068,619. This application Feb. 28, 1977, Ser. No. 773,091
Int. Cl.[2] B05D *1/18*
U.S. Cl. 427—434 D 1 Claim



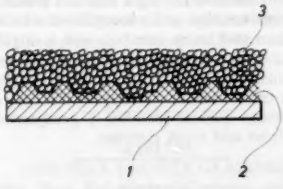
1. A method of applying liquid resin to elongated strand material, said method comprising:
(a) maintaining a supply of said resin in a container;
(b) positioning a partially immersed roller in said resin supply;
(c) operatively contacting said roller on the downstream side thereof with an end of a stationary flat plate and extending said plate downwardly from the line of roll contact and at an angle of about 10° from the horizontal, the other end of said plate being disposed above said supply;
(d) rotating said roller whereby resin is transferred from said supply, onto said plate and at least in part recovered into said supply from the said other plate end;
(e) feeding at least one said strand in a path above but operatively associated with said plate;
(f) providing a horizontally disposed pressure arm above said path;
(g) providing a vertical component of motion to said arm whereby to selectively permit disposition of said strand above said plate or to press said strand into the resin transferred onto the plate by said roller.

4,101,696

THERMOGRAPHIC PLATE FOR MEASURING TEMPERATURE DISTRIBUTIONS

Friedrick Jennen, Bergisch-Gladbach, Germany, and Jean Tricoire, Paris, France, assignors to Troponwerke Dinklage & Co., Cologne, Germany

Filed Jul. 30, 1976, Ser. No. 709,991
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1975, 2536773
Int. Cl.[2] G01K *11/12*
U.S. Cl. 428—1 8 Claims



1. A thermographic plate with an overal thickness of less than 200 μm consisting of a transparent carrier film, an intermediate latex-based black layer on said film and a layer containing liquid crystals disposed on the intermediate layer, the improvement comprising the black layer having an average thickness in the range of 4–18 μm and comprising an irregular array of individual black islands produced by spray coating a plurality of successive spray coats of latex with intermediate

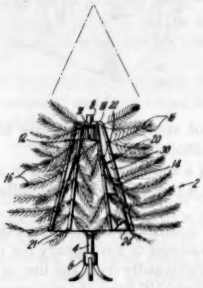
drying on the otherwise transparent carrier film, to provide a statistically fluctuating transparency.

4,101,697

CONE LIKE SHEET FOR CHRISTMAS TREE

Percy Dieffenbach, Moscow, Pa., and Louis Zon, Clarence, N.Y., assignors to American Technical Industries, Inc., Mount Vernon, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,772
Int. Cl.[2] A47G *33/06*
U.S. Cl. 428—9 **2 Claims**



1. An artificial shrub comprising:
a cylindrical trunk member having a central axis oriented in a substantially vertical direction;
a plurality of limb assemblies, each of said limb assemblies including a main limb having a hooked end and a number of cross limbs, said cross limbs being attached to said main limb;
a bracket mounted circumferentially about said trunk member at a first predetermined height, said bracket including an outwardly extending flange having a plurality of circumferential apertures, the hooked ends of said main limbs of said limb assemblies being insertable into said apertures so that said limb assemblies are suspended from said flange in a substantially circumferential array to define a substantially conical space;
a frusto conical member of a flexible material having an apex end and a base end;
second bracket means for attaching the apex end of said frusto conical member to said trunk member at a second predetermined height which is less than said first predetermined height such that said frusto conical member hangs downwardly from said second bracket means within said substantially conical space; and
support means attached to said trunk member at a third predetermined height which is less than said second predetermined height, said support means including at least one support member having a first end which is attached to said trunk member and a second end which is radially spaced from said trunk member, and a ringlike member attached to the second end of said support member so that said ringlike member is mounted substantially coaxially with said trunk member to support the base end of said flexible frusto conical member a predetermined radial distance from said trunk member.

4,101,698

ELASTOMERIC REFLECTIVE METAL SURFACES

Richard E. Dunning, Munster, Ind., and Victor H. Rampelberg, Flossmoor, Ill., assignors to Avery International Corp., San Marino, Calif.

Filed Jul. 14, 1975, Ser. No. 595,547
Int. Cl.[2] B60R *13/00*
U.S. Cl. 428—31 **12 Claims**

1. A laminate for transferring a decorative metallized finish to a substrate comprising a substantially transparent, flexible and foldable, self-supporting elastomeric film of polyurethane material; a reflective metal layer bonded to a surface of the elastomeric film in microscopically discontinuous quantities in an amount which forms an apparent optically continuous reflective surface and which is elastically deformable in response

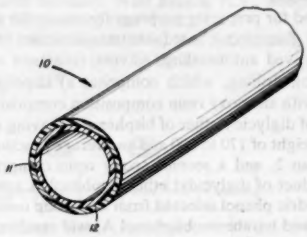
to corresponding deformation of the elastomeric film; and an adherence layer on the side of the metal layer opposite the elastomeric film for adherently attaching the metal layer to a substrate so the elastomeric film provides a protective outer covering for the adherently attached reflective metal layer.

4,101,699

SYNTHETIC RESINOUS TUBE

Clifford R. Stine, Solon, and Jennings A. Boyce, Ravenna, both of Ohio, assignors to Samuel Moore & Company, Mantua, Ohio

Filed Nov. 23, 1973, Ser. No. 418,204
Int. Cl.[2] B29F *3/10*; B32B *31/30, 27/32*
U.S. Cl. 428—36 **1 Claim**



1. A dimensionally stable tube having a plurality of layers of different polymeric materials cohesively bonded together, said tube having been made by the method comprising simultaneously coaxially extruding a plurality of contiguous tubular layers of different fuse bondable thermoplastic polymeric materials, at least one of the layers being susceptible to cross-linking by electron irradiation and at least one layer being substantially nonsusceptible to cross-linking by electron irradiation, and irradiating the resulting tube until cross-linking of the susceptible thermoplastic layer has progressed to a point where the said susceptible layer is substantially non-thermoplastic, wherein the at least one layer which is susceptible to cross-linking is an ethylene-propylene-diene terpolymer composition and the at least one layer which is substantially nonsusceptible to cross-linking is a polyethylene composition.

4,101,700

THERMALLY INSULATING DUCT LINER

Richard James Ray, Jr., Toledo; Daniel Paul Kopy, Rossford, and Theodore Richard Rohweder, Toledo, all of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 12, 1976, Ser. No. 666,523
Int. Cl.[2] B32B *3/10*
U.S. Cl. 428—131 **13 Claims**

1. A flexible air duct liner comprising an outer thermal insulation layer of fibrous material and an inner working face layer of higher density than said insulation layer and having resistance to erosion from an adjacent gaseous stream; the improvement comprising:
said working face layer comprising a thin fibrous facing of

rayon having a relatively open structure adhered to said thermal insulation layer and having been coated in place with a flame retardant coating containing polyvinyl acetate producing a duct liner having a flame spread classification of less than 25, a smoke developed classification of less than 50, and a surface roughness (e) of less than about 0.0025 feet.

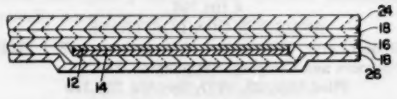
4,101,701
I.D. CARDS

Michael E. Gordon, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 361,232, May 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 148,768, Jun. 1, 1971, abandoned. This application Sep. 30, 1976, Ser. No. 728,311

Int. Cl.² B32B *3/00, 27/06*

U.S. Cl. 428—189 **2 Claims**



1. An I.D. card laminar structure including a transparent polyester front sheet the inner surface of which is provided with a first layer of a heat-activated adhesive comprising an ethylene acrylic acid copolymer or an ethylene ethyl acrylate copolymer or mixtures of these and a second layer comprising a mixture having a ratio of about 2:1 of polyvinyl alcohol and poly-4-vinylpyridine; a diffusion transfer photograph of smaller dimensions than said sheet material and having a dye image containing receiving layer comprising a mixture of polyvinyl alcohol and poly-4-vinylpyridine, said photograph being substantially centered on said front sheet, with the image receiving layer bonded to said front sheet through said two layers, leaving a peripheral area of said front sheet free from contact with said photograph, a back sheet of substantially the same dimensions as said front sheet having thereon a layer of a heat-activated adhesive comprising an ethylene acrylic acid copolymer or an ethylene ethyl acrylate copolymer or mixtures thereof and peripheral areas of said front and back sheets being sealed together to complete said lamination.

4,101,702
COMPOSITE SHEET MEMBER HAVING A PLURALITY OF COEXTRUDED LAMINAR LAYERS

Geoffrey B. Churchill, Wilbraham, and J. Craig White, Feeding Hills, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 18, 1977, Ser. No. 843,185

Int. Cl.² B32B *7/00*

U.S. Cl. 428—213 **21 Claims**

1. A composite sheet member having a plurality of coextruded laminar layers comprising:

A. a base layer formed from a first ABS polyblend having a thickness of about 55 to 99% of the thickness of said composite sheet member, said first polyblend having a grafted diene rubber content of 5 to 25% by weight of said polyblend and at least one,

B. external layer formed from a second ABS polyblend having a thickness of 1 to 45% of the thickness of said composite sheet member said second polyblend having a grafted diene rubber content of 7 to 35% by weight of said second polyblend, said external layer having present at least about 10% more grafted rubber than said base layer.

4,101,703
COATED CEMENTED CARBIDE ELEMENTS

Wilfried Schintlmeister, Reutte, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

Continuation of Ser. No. 329,128, Feb. 2, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,695

Claims priority, application Austria, Feb. 4, 1972, 896/72; Jul. 21, 1972, 6317/72

Int. Cl.² B32B *15/04, 9/04*

U.S. Cl. 428—216 **19 Claims**

3. An article of manufacture comprising:

(a) a hard metal or sintered carbide substrate; and

(b) a composite coating on at least one surface of said substrate, said composite coating including a layer of titanium carbide and a layer of titanium nitride overlying and adjacent said layer of titanium carbide.

15. An article of manufacture comprising:

(a) a hard metal or sintered carbide substrate; and

(b) a composite coating on at least one surface of said substrate, said composite coating including a layer of titanium carbide, a transition layer containing titanium carbonitrides overlying said layer of titanium carbide and a layer of titanium nitride overlying said transition layer.

4,101,704
ENERGY ABSORBING MATERIALS

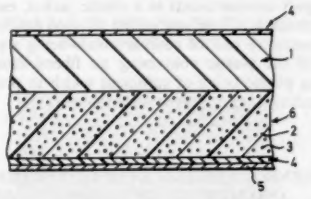
Maurice Arthur Frederick Hiles, Welwyn, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 681,528, Apr. 29, 1976, abandoned. This application Oct. 29, 1976, Ser. No. 736,936

Claims priority, application United Kingdom, Jul. 23, 1976, 30881/76

Int. Cl.² B32B *27/40, 27/08*

U.S. Cl. 428—218 **16 Claims**



1. An energy-absorbing material which comprises an elastomer layer of polymeric material having a low compression set and a delayed recovery from compression, in combination with a more difficultly compressible layer, said last mentioned layer comprising a tough flexible polymeric matrix having a plurality of substantially unbroken rigid hollow bodies embedded therein the arrangement being such that under the action of deforming forces deformation of the layers takes place sequentially.

4,101,705
NEUTRAL BRONZE GLAZINGS

Klaus Fischer, Porz, Fed. Rep. of Germany, and Robert Keul, Cormeilles-en-Parisis, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 2, 1975, Ser. No. 637,016

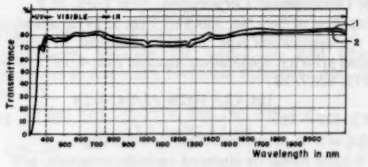
Claims priority, application France, Dec. 3, 1974, 74 39459

Int. Cl.² C23C *3/24, 3/30*; B32B *17/10*

U.S. Cl. 428—220 **20 Claims**

1. An article of manufacture comprising a glass sheet at a thickness suitable for glazing, used for windows and windshields of automotive vehicles, said glazing having a total

luminous transmittance above 70% and a monochromatic transmittance which on the average value decreases from the



long wavelengths to the short wavelengths in the visible spectrum from about 5 to 50%.

4,101,706

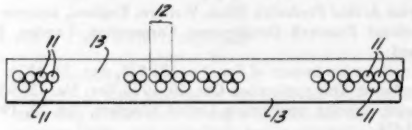
STRAPPING TAPES

Richard I. Wolkowicz, Scotch Plains, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 672,027, Mar. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 503,330, Sep. 5, 1974, abandoned. This application Sep. 6, 1977, Ser. No. 830,788

Int. Cl.[2] D04H *3/02*

U.S. Cl. 428—294 **4 Claims**



1. A strapping tape having high tensile strength and low elongation comprising groups of plied twisted long-chain aromatic polyamide fibers arranged in a single layer in at least two spaced-apart compartments in a plastic jacket, each compartment containing at least one group of plied twisted fibers and each consecutive pair of compartments being separated by a portion of the plastic containing no fibers, said portion of separating plastic being of sufficient width to prevent roping and spreading when the tape is under stress.

4,101,707

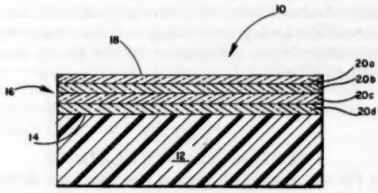
HOMOGENEOUS MULTILAYER DIELECTRIC MIRROR AND METHOD OF MAKING SAME

Rodney D. Henry, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 4, 1977, Ser. No. 784,394

Int. Cl.[2] G02B *5/08, 1/02, 5/14*; H01S *3/00*

U.S. Cl. 428—409 **3 Claims**



1. A multilayer dielectric laser mirror comprising:

a garnet substrate having a substantially rectangular cross-section wherein at least one side of said substrate is a mirror surface chemical-mechanical polished to be relatively free of inhomogeneous strain and wherein said garnet is a metal oxide having the general formula $J_3Q_5O_{12}$ wherein O is oxygen, J is at least one element selected from the group consisting of the lanthanide series of the Periodic Table, lanthanum, yttrium, magnesium, calcium, strontium, barium, lead, cadmium, lithium, sodium, and potassium, and Q is at least one element selected from the group consisting of gallium, indium, scandium, titanium, vanadium, chromium, manganese, rhodium, zirconium, hafnium, molybdenum, niobium, tantalum, tungsten, and alluminum; and

a mirror coating deposited on said mirror surface of said substrate, said mirror coating consisting of a first plurality of layers of a first non-magnetic dielectric material having a relatively higher index of refraction and a second plurality of layers of a second non-magnetic dielectric material having a relatively lower index of refraction wherein said layers of said first dielectric material are interleaved alternately with said layers of said second dielectric material in a stacked relationship relative to each other and relative to said mirror, and wherein said first and second dielectric materials are selected from the group consisting of titanium dioxide, magnesium fluoride, and silicon dioxide.

4,101,708

RESISTOR COMPOSITIONS

John Robert Larry, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 25, 1977, Ser. No. 781,310

Int. Cl.[2] H01B *1/08*

U.S. Cl. 428—432 **10 Claims**

1. Printable compositions of finely divided inorganic powder dispersed in an inert liquid vehicle for producing film resistors adherent to a dielectric substrate, the compositions consisting essentially of, by weight, a dispersion of

(1) 2–45% finely divided RuO_2 powder

(2) 40–70% glass comprising 30–55% PbO,

(3) 0.1–0.8% Nb_2O_5,

(4) 0–5% CaF_2, and

(5) 15–40% inert vehicle.

4,101,709

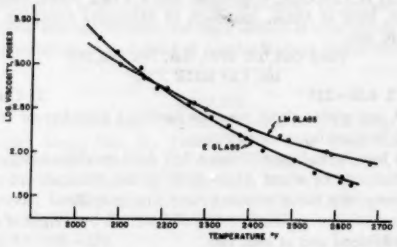
LOW MODULES GLASS FIBERS AND LAMINATE REINFORCED WITH SAME

Tack J. Whang, Berea, and Robert W. Pelz, West Richfield, both of Ohio, assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 151,990, Jun. 10, 1971, abandoned, which is a continuation of Ser. No. 40,331, May 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 723,780, Apr. 24, 1968, abandoned. This application Apr. 25, 1973, Ser. No. 354,423

Int. Cl.[2] B32B *15/00*

U.S. Cl. 428—433 **17 Claims**



10. In combination, a layer of fiberglass reinforced thermoset resin laminate containing and reinforced with from about 40 to about 85 weight percent, based on the weight of the laminate, of a low modulus glass fiber reinforcement, said glass having the following composition:

	Wt.%
SiO_2	40–65
B_2O_3	24–38
$Na_2O + K_2O$	5–20
Li_2O	0–2
PbO	0–17
CaO	0–2
Al_2O_3	0–7
Fe_2O_3	0–2
TiO_2	0–3
F_2	0–2

said glass including at least one of the systems selected from the group consisting of SiO_2-B_2O_3-Na_2O/K_2O-PbO-Al_2O_3 and SiO_2-B_2O_3-Na_2O/K_2O, wherein, when Al_2O_3 is present, PbO is present, and the ratio of PbO:Al_2O_3 is from about 1:1 to about 3:1, and, when PbO is absent, so are all constituents other than SiO_2, B_2O_3 and Na_2O/K_2O, the parts by weight of the foregoing components totalling 100 as they vary within the indicated ranges respectively, said glass having a modulus of elasticity of from about 5.0 to about 6.5 $\times$ 10^6 psi, with a layer of fired ceramic, said glass present in said laminate substantially as chemically constituted when fiberized.

4,101,710

SILVER COMPOSITIONS

Sanford Morton Marcus, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1977, Ser. No. 775,274
Int. Cl.² H01B *1/08*
U.S. Cl. 428—472 **15 Claims**

1. A conductive silver composition useful for producing in a single application step solderable metal coatings on ceramic titanate bodies, said silver compositions being a mixture of finely divided inorganic particles dispersed in a vehicle, the inorganic particles consisting essentially of about, by weight,

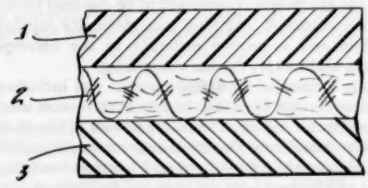
(A) (1) 75–98% silver
(2) 2–6% boron, and
(3) 1–22% glass, PbF_2, or mixtures thereof, or
(B) (1) 40–70% silver,
(2) 25–60% $Ni_3B_{1-x}P_x$ wherein x is in the approximate range 0–0.6, and
(3) 3–22% glass, PbF_2, or mixtures thereof, or
(C) mixtures of (A) and (B).

4,101,711

BONE RESISTANT PACKAGING MATERIAL

Nathan Stillman, Walnut Creek, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,091
Int. Cl.² B32B *27/08, 27/32, 27/34;* B23B *27/36*
U.S. Cl. 428—474 **8 Claims**



1. A packaging laminate comprising:
a polyamide face film;
a filamentary non-woven synthetic-resin web bonded to said face film; and
a film of an olefinic acid or ester-type synthetic resin resistant to organic solvents affixed to said filamentary web.

4,101,712

METHOD OF PRODUCING A MATERIAL WITH LOCALLY DIFFERENT PROPERTIES AND APPLICATIONS OF THE METHOD

Michael J. Bomford, Clehonger, England, and Gernot Gessinger, Bublikon, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 2, 1975, Ser. No. 637,060
Claims priority, application Switzerland, Dec. 23, 1974, 17239/74
Int. Cl.² B22F *1/00, 3/16, 5/04*
U.S. Cl. 428—547 **6 Claims**

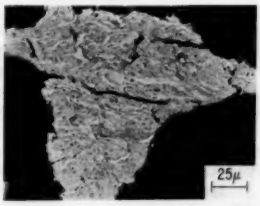
1. A method of producing a turbine blade with locally different properties, comprising:
filling a form with two different component powders such that the ratio of contents of said powders in the mixture continuously varies over the spatial extent of the form; wherein each of the powdered components to be mixed together is introduced in the desired proportion by a conveyer proportioning screw into another mixing screw and therefrom is deposited in the mixed state into said form; and wherein one of said powders is a high strength super-alloy and is the predominant ingredient of said mixture in the portion of the workpiece intended for the blade foot, and the other powder is a non-corrosive Co- or Ni-base alloy and is the predominant ingredient of said mixture in the portion of the workpiece intended for the blade tip, and the transition from one powder to the other along the length of the workpiece is continuous;
compacting the mixed powders in the form; and
subsequently sintering the compacted powders.

4,101,713

FLAME SPRAY OXIDATION AND CORROSION RESISTANT SUPERALLOYS

Harold H. Hirsch, and John R. Rairden, III, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,440
Int. Cl.² B32B *15/20*
U.S. Cl. 428—554 **24 Claims**



Attrited Co-32Cr-3Al Plane Spray Powder Morphology

1. An article comprising a coated superalloy body, said body having been flame spray coated with high energy milled, mechanically alloyed powder particles having an average particle size of less than about 44 microns.

4,101,714

HIGH TEMPERATURE OXIDATION RESISTANT DISPERSION STRENGTHENED NICKEL-CHROMIUM ALLOYS

John R. Rairden, III, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,187
Int. Cl.² B32B *15/20*
U.S. Cl. 428—639 **8 Claims**

1. An article of manufacture comprising a high temperature oxidation resistant dispersion strengthened nickelchromium alloy body comprising:
(a) said nickel-chromium alloy body;

(b) a first coating of cobalt having at least a portion thereof diffused therein, and

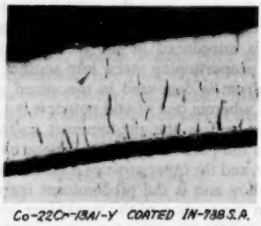
(c) an overcoating of aluminum, said second coating being substantially nonporous and adherent to the cobalt-coated nickel-chromium alloy body.

4,101,715

HIGH INTEGRITY CoCrAl(Y) COATED NICKEL-BASE SUPERALLOYS

John R. Rairden, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,936
Int. Cl.[2] B32B *15/20*
U.S. Cl. 428—652 6 Claims



Co-22Cr-13Al-Y COATED IN-738 S.A.

1. A high temperature oxidation and corrosion resistant coated nickel-base superalloy article having a thermal expansion coefficient value in inches per inch per ° F. measured over a temperature range of

(i) 100°–1200° F. of from 8.45 to 9.05, and

(ii) 100°–1740° F. of from 9.45 to 10.05;

comprising:

(a) a nickel-base superalloy, and

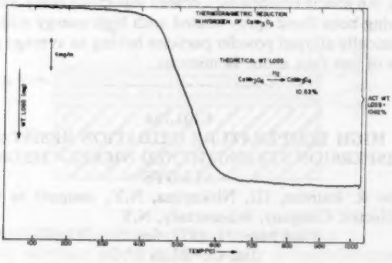
(b) a first CoCrAl(Y) coating composition consisting essentially of, on a weight basis, approximately 26–32 percent chromium, 3–9 percent aluminum, and 0–1 percent yttrium, other rare earth elements, platinum or rhodium, and the balance cobalt.

4,101,716

USE OF HIGH SURFACE AREA MIXED METAL OXIDES OF MANGANESE AND CALCIUM IN ELECTROCHEMICAL PROCESSES

Harold S. Horowitz, Clark, and John M. Longo, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 15, 1977, Ser. No. 824,630
Int. Cl.[2] H01M *4/86, 4/50*
U.S. Cl. 429—13 14 Claims



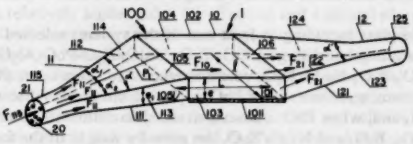
1. An electrical energy storage system comprising a cathode active material selected from the group consisting of $CaMn_3O_6$, $CaMn_4O_8$ and $CaMn_7O_{12}$ in combination with an anode and an electrolyte.

4,101,717

ELECTROCHEMICAL GENERATORS WITH A SEDIMENTATION BED AND DIVERGENT FEED

Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 4, 1977, Ser. No. 821,759
Claims priority, application France, Aug. 6, 1976, 76 24466
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—15 30 Claims



1. A process for the production of electric current utilizing electrochemical reactions in a generator comprising at least one cell having at least one compartment containing a liquid electrolyte and having an inlet, an outlet, an upper face and a lower face, the surface of the lower face being formed at least in part by all or part of the surface of at least one electron collector arranged on the electrolyte side, said process consisting in creating a flow through the compartment of the electrolyte containing solid particles which are at least partially active and/or solid particles transporting at least one active material, the density of the particles being greater than the density of the electrolyte, characterized by the fact that a divergence of the streamlines of the flow is brought about before the flow penetrates into the compartment so as to obtain a substantially homogeneous distribution of the particles at the inlet to the compartment over the entire width of the lower face, and characterized by the fact that, at least in a portion of the compartment, the particles move in the form of a sedimentation bed which is contiguous to the surface of the lower face and substantially homogeneous over the entire width of the lower face, the sedimentation bed being entrained by the electrolyte.

4,101,718

BATTERY OF LAMINATED STRUCTURE HAVING BATTERY FRAME OF NOVEL STRUCTURE

Kohki Tamura, and Kazuo Iwamoto, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd. and Hitachi, Ltd., both of, Japan

Filed Apr. 1, 1977, Ser. No. 783,739
Claims priority, application Japan, Apr. 9, 1976, 51-39245
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—26 15 Claims

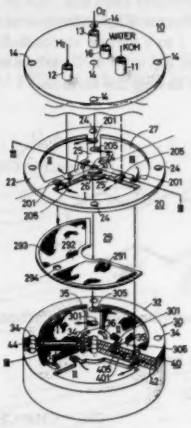
1. A battery having a plurality of unit cells, each cell including a chamber for cathode active material, a chamber for electrolyte, and a chamber for anode active material, the chamber for the electrolyte constructed to be disposed between the other two chambers, and fluid path means for supplying the electrolyte and respective materials to the corresponding chambers, said battery further comprising:

a frame formed of insulating material and including three spaces divided by walls, the first of the spaces used as the chamber for the electrolyte, the second of the spaces used as the chamber for the anode active material, and the third of the spaces closed at one end thereof by insulating material and formed with the chamber for the cathode active material,

an electrode plate attached to one end of said first and second spaces in a manner the first space is formed with a chamber for the electrolyte and the second space is formed with a chamber of the anode active material, and

a plurality of said frames attached with said electrode plate, forming said unit cell in a manner that the frames are so

positioned that the chamber for the electrolyte of the frame of one layer is disposed between the chambers for



the anode and cathode active materials of the two adjacent frames of the two adjacent layers.

4,101,719

SILVER(II) OXIDE CELL AND ITS MANUFACTURE

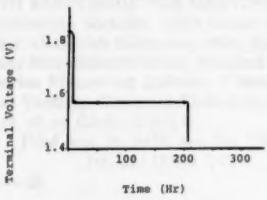
Yoshio Uetani; Akio Shimizu; Kozo Kajita; Hiroshi Ishiuchi; Tadashi Goryo, and Kazuo Ishida, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Filed Jul. 18, 1977, Ser. No. 816,804

Claims priority, application Japan, Jul. 16, 1976, 51-85470; Jul. 16, 1976, 51-85471; Jul. 16, 1976, 51-85472

Int. Cl.[2] H01M *10/32*

U.S. Cl. 429—206 **22 Claims**



1. A silver(II) oxide cell which comprises a positive electrode comprising a shaped body of silver(II) oxide as a positive active material, a negative electrode comprising a negative active material and an alkaline electrolyte, characterized in that the shaped body is a molding product of a composition comprising particles of which each particle comprises a core part of silver(II) oxide and a surface part of silver(I) oxide integrally and continuously provided around the core part.

4,101,720

DEGRADABLE PLASTIC

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 230,969, Mar. 1, 1972. This application Jan. 2, 1976, Ser. No. 646,097

Int. Cl.[2] C08K *3/32, 3/38*

U.S. Cl. 526—3 **46 Claims**

1. As a composition of matter, a plastic composition which is degradable in the absence of electromagnetic radiation and consists essentially of an organic polymer having dispersed therein at least one transition-metal derivative and at least one readily autoxidizable organic material, said transition-metal derivative and readily autoxidizable organic material both being present in an amount sufficient to cause degradation of said polymer in the absence of electromagnetic radiation, and said readily autoxidizable organic material containing at least one carbon-hydrogen bond which is activated with respect to hydrogen-atom abstraction by an adjacent multiply bonded atom or an adjacent heteroatom and being a material which reacts with gaseous oxygen at a reaction rate more rapid than the corresponding reaction, under comparable conditions, of gaseous oxygen with an equal weight of said polymer in the absence of said readily autoxidizable material and being an acetal compound selected from the group consisting of α-amyl cinnamaldehyde dimethyl acetal; citral dimethyl acetal; hydratropic aldehyde dimethyl acetal; and phenylacetaldehyde diethyl acetal.

4,101,721

SOLID PHASE SYNTHESIS OF PROTECTED PEPTIDES

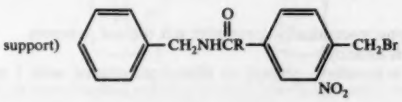
Daniel H. Rich, Madison, Wis., and Sweet K. Gurwara, Williamsville, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 9, 1976, Ser. No. 748,948

Int. Cl.[2] C08F *8/18*

U.S. Cl. 526—19 **15 Claims**

1. A supported 3-nitro-4-bromomethyl benzoyl amide having the general formula



in which R is 0-8 carbon atoms in an alkyl or substituted alkyl group.

4,101,722

POLYMERIZATION PROCESS USING SPRAY DRIED TITANIUM-CONTAINING CATALYST

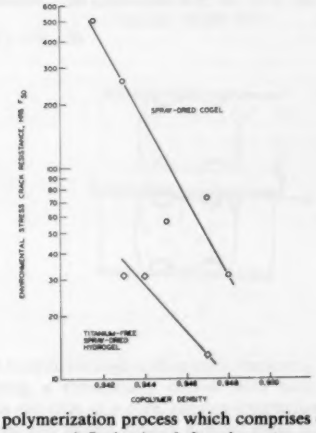
John P. Hogan, and Donald D. Norwood, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 607,977, Aug. 26, 1975, Pat. No. 4,053,436. This application Feb. 4, 1977, Ser. No. 765,471

Int. Cl.[2] C08F *4/78, 10/00, 10/14*

U.S. Cl. 526—106 **10 Claims**

ESCR OF ETHYLENE-HEXENE COPOLYMERS OF 0.3-0.4 MI.



1. A polymerization process which comprises contacting at least one monoolefin having 2–8 carbon atoms per molecule

under polymerization conditions with a catalyst produced by forming a hydrogel by contacting an alkali metal silicate with a material selected from the group consisting of acids, acidic salts, and carbon dioxide, said hydrogel having coprecipitated therewith a titanium compound, spray drying said thus-formed hydrogel to form a xerogel; thereafter calcining said xerogel to form a said catalyst, said xerogel before calcining containing in addition 0.1 to 20 weight percent chromium calculated as CrO_3 based on the total weight of said catalyst.

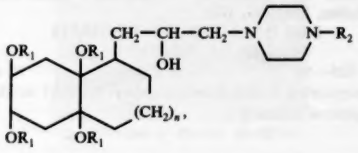
4,101,723

SUBSTITUTED PIPERAZINOPROPANOLS

Frederic P. Hauck, Somerville; Rita T. Fox, Princeton, and John R. Watrous, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 5, 1977, Ser. No. 784,888
Int. Cl.[2] C07D *401/04, 295/08*
U.S. Cl. 544—360 **16 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

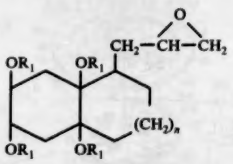
R_1 is alkanoyl;

R_2 is pyridinyl, phenyl, or phenyl substituted with 1 or 2 halogen, alkyl, trifluoromethyl, alkoxy or alkylthio groups; and

n is 0, 1 or 2;

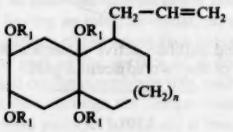
and wherein the terms alkyl, alkoxy and alkylthio refer to groups having 1 to 6 carbon atoms and the term alkanoyl refers to groups having 1 to 7 carbon atoms.

15. A compound having the formula



wherein R_1 is alkanoyl having 1 to 7 carbon atoms and n is 0, 1 or 2.

16. A compound having the formula



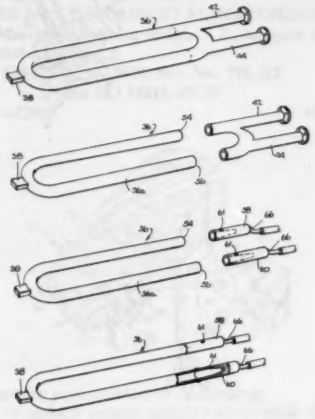
wherein R_1 is alkanoyl having 1 to 7 carbon atoms and n is 0, 1 or 2.

4,101,724

FURNACE CONVERSION METHOD AND APPARATUS

Hans Gunther Heine, Little Silver; Otto Hochstrasser, North Brunswick, both of N.J., and Fritz Hegewaldt, Herdecke, Fed. Rep. of Germany, assignors to Brown Boveri Corporation, North Brunswick, N.J.

Filed Jun. 30, 1976, Ser. No. 701,013
Int. Cl.[2] F27D *11/02*; H05B *3/06, 3/40*
U.S. Cl. 13—1 4 Claims



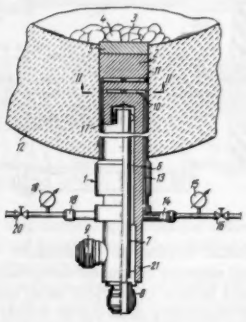
1. A method of converting a fuel-fired radiant tube type furnace to electrical operation, said method comprising the steps of disconnecting from the radiant tubes of said furnace, their fuel-fired source and their exhaust, and connecting electrical supply means to the tubes to drive electrical current longitudinally through the walls of said radiant tubes.

4,101,725

HEARTH ELECTRODE FOR MELTING FURNACES

Nikolai Semenovich Shelepov, ulitsa Geroev Kosmosa, 2a, kv. 96; Valery Alexeevich Kildjushev, ulitsa Kuibysheva, 23, kv. 18; Evgeny Mitrofanovich Kitaev, Ploschad Revoljutsii, 4, kv. 37; Vissarion Makarovich Dubodin, 2 Mokhovoi proezd, 24, kv. 7, and Vladimir Alexeevich Kochetkov, Bulvar Jubileiny, 29, kv. 15, all of Gorky, U.S.S.R.

Filed Aug. 16, 1976, Ser. No. 714,605
Int. Cl.[2] H05B *7/08*
U.S. Cl. 13—18 7 Claims



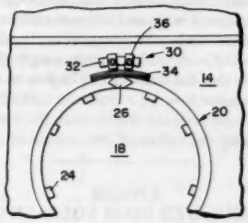
1. A hearth electrode for melting furnaces comprising a cylinder, one end of said cylinder having an outer surface thereof and being adapted for contacting a melt stock or melt within the melting furnace, an inner space of said cylinder being adapted for providing a coolant passageway; passage means for detecting local burnings-through or consumption by burning in said bottom being filled with gas under a pressure differential with respect to the static pressure within the melting furnace, said passage means being provided all along the electrode cross section and lying in a longitudinal plane of said bottom between said outer surface and said inner space of the electrode; and a sensor for pressure control in communication with said passage means for detecting a pressure change in said passage means.

4,101,726

WATER COOLING JACKET FOR INDUCTION FURNACE WATER BUSHING

Bernard L. Griffiths, Susuin, Calif., assignor to Atlas Foundry & Mfg. Co., Richmond, Calif.

Filed Jan. 17, 1977, Ser. No. 760,185
Int. Cl.[2] H05B *5/14*
U.S. Cl. 13—29 9 Claims



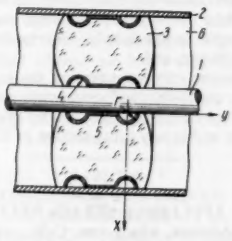
1. In an induction melting furnace which includes a hearth, a passage through said hearth surrounded by refractory material, an induction transformer disposed in said passage, a bushing lining said passage, and having a longitudinally extending gap, a gasket element sealing the gap, and cooling liquid means associated with said bushing, the improvement comprising a water jacket overlying said gasket element, and means for circulating water through said jacket.

4,101,727

HIGH-TENSION ELECTRIC CABLE

Vladimir Ilich Levitov, ulitsa Vavileva 48, kv. 7; Andrei Grigorievich Lyapin, Vystavochny pereulek 5, kv. 39, and Oleg Vasilievich Scherbina, ulitsa Amundsena 16, kv. 76, all of Moscow, U.S.S.R.

Continuation of Ser. No. 531,814, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 278,653, Aug. 7, 1972, abandoned. This application Aug. 16, 1976, Ser. No. 714,748
Int. Cl.[2] H01B *9/04*
U.S. Cl. 174—28 1 Claim



1. An improved high-tension cable employing an outer metal sheathing; a substantially coaxial inner current-conducting wire in the form of a core, running longitudinally inside said sheating, and having radially directed outer surfaces that are

substantially parallel with the longitudinal direction of the cable; a main insulation of compressed gas filling the space between said core and said sheathing; spaced-apart, partly toroidal insulator elements for supporting and coaxially securing said core relative to said sheathing, said insulator elements narrowing in at least their portions that face and contact said core, and having therein at least one pair of semicircular grooves in at least said contact portions of the insulator elements, said improvement comprising: said grooves being open towards said core; and at least one pair of shielding screen electrodes in electrical contact with at least said core, built into said grooves in the insulator elements, adjoining said contact portions of the latter; said screen electrodes having dimensions conforming to one-quarter of the distance between said screen electrodes; said insulator elements having side surfaces facing in the longitudinal direction, with a partly rectilinear and partly toroidal generatrix, the latter coinciding with the electrostatic line of force of the electric cable, at any point of which the gradient of electrostatic potential is lower than the gradient on said outer core surfaces in at least one of the spaces between successive ones of said insulator elements; said side surfaces being aligned with said current-conducting core; the line of force, coinciding with the generatrix of said insulator side surfaces, being so disposed in any longitudinal section of the electric cable that the line of force begins on said outer core surfaces at a distance $x = 1.1\ r$ from the center of the semicircular section of said grooves which have therein said shielding electrodes, r being the radius of the section of said grooves.

4,101,728

GAS INSULATED HIGH VOLTAGE CABLE

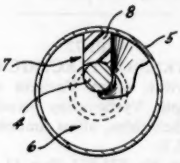
Jan Artbauer, Hanover, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 827,615

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638610

Int. Cl.[2] H01B *9/06*

U.S. Cl. 174—29 **11 Claims**



1. A gas insulated high voltage cable, comprising:

an outer tubular metal conductor having an inner surface and a tubular interior;

at least one conductor disposed in the outer conductor and having a surface which is asymmetrical with respect to the inner surface of the outer conductor so that the electric field strength in the tubular interior varies around the inner conductor; and

insulative spacer means supporting the inner conductor in the outer conductor and occupying zones of maximum electric field strength in the tubular interior of the outer conductor and in any cross-section of the cable.

4,101,729

APPLIANCE STRAIN RELIEF

Charles A. Balchunas, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed Feb. 4, 1977, Ser. No. 765,664

Int. Cl.[2] H01R *13/58;* **D06F** *75/28*

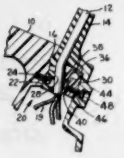
U.S. Cl. 174—65 R **7 Claims**

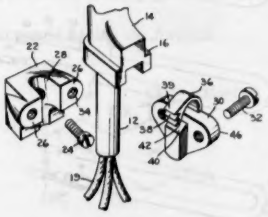
1. In a portable electric appliance cord-connected to internal electric terminals by multiple conductors, the improvement in a strain relief assembly between the cord and appliance comprising,

a housing chamber in the appliance at the cord entrance,

a formed saddle secured to the chamber and having spaced ears defining a passage therebetween aligned with the lay of the cord to contain the cord conductors,

a formed clamp fitting over said saddle and removably attached thereto,





said clamp having a toothed flexible extension disposed into said passage against the conductors therein,

a wedge means on said clamp opposite said extension, and

a cover over said clamp and saddle,

whereby said flexible extension is forced by said wedge means into biting engagement with said conductors in said passage permitting said strain relief assembly to be used with different-sized conductors.

4,101,730

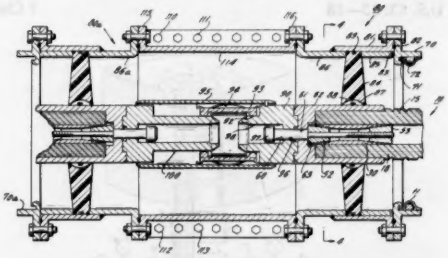
TERMINATION FOR STRANDED CABLE

Philip C. Netzel, Milmont, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 25, 1977, Ser. No. 771,943

Int. Cl.[2] H02G *15/02*

U.S. Cl. 174—75 R **9 Claims**



1. An electrical terminal in combination with a stranded conductor; said stranded conductor comprising, at its terminal end, a generally hollow cylindrical form; said terminal comprising a rigid conductive outer sleeve closely surrounding the exterior of said generally hollow cylindrical form; a hollow elongated cylindrical conductive member disposed inside said cylindrical stranded conductor form; a pair of wedge-shaped nuts fitted into the opposite ends of said hollow elongated cylindrical conductive member; bolt means connected to said pair of wedge-shaped nuts and operable for drawing said

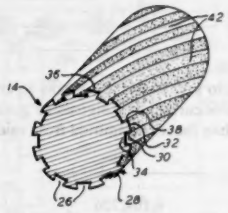
wedge-shaped nuts toward one another to outwardly distort the respective ends of said hollow elongated cylindrical member and to press said strands of said generally hollow cylindrical form into high pressure engagement with said conductive outer sleeve; said bolt means being operable from a region external of said hollow cylindrical form.

4,101,731

COMPOSITE MULTIFILAMENT SUPERCONDUCTORS

William G. Marancik, Basking Ridge, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Aug. 20, 1976, Ser. No. 716,312
Int. Cl.[2] H01L *39/02*
U.S. Cl. 174—126 S **16 Claims**



15. A composite superconductor comprising:

a plurality of unitary central metallic wires made of a normally conductive metal, each said wire having a plurality of spaced grooves extending longitudinally along each said wire, each said groove undercutting the surface of one said wire;

a thin film of substantially stoichiometric superconductive Nb_3Ge sputter-deposited on a portion of each said groove and also on the surface between adjacent grooves, at least part of each undercutting portion of each groove being deposit-free; and

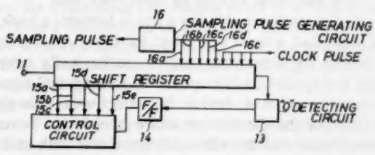
said plurality of wires being consolidated into said composite structure by an enveloping metallic matrix of a normally conductive metal.

4,101,732

START AND STOP SYSTEM

Seigo Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Oct. 19, 1976, Ser. No. 733,926
Claims priority, application Japan, Oct. 20, 1975, 50-126216
Int. Cl.[2] H04L *5/24*
U.S. Cl. 178—53.1 R **4 Claims**



1. A start and stop control apparatus for successively transferring a plurality of data frames each including start, data and stop bit pulses, comprising:

a shift register having a plurality of stages for continuously storing binary first information items corresponding to the start bit pulse of each data frame in response to a series of clock pulses;

a detector circuit for generating an output in response to the binary first information item corresponding to the head of the continuous binary first information items stored in the shift register, which has been delivered from the output terminal of said shift register;

a control circuit for looping the shift register with a register length corresponding to the number N of the continuous binary first information items in response to the output from said detector circuit and for detecting the last stage of the looped shift register;

a sampling pulse output circuit for storing a binary second information item into the N/2th stage of the shift register in response to the detected last stage and for generating a sampling pulse in response to said binary second information item every time said shift register finishes one loop operation with said register length;

means for sampling data from the middle portion of each of said data bit pulses in response to said sampling pulse from said sampling pulse output circuit; and

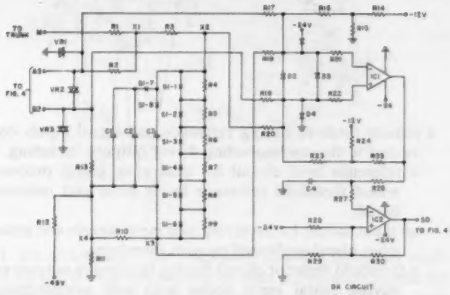
means for storing binary second information items throughout the shift register in response to the stop bit pulse of each data frame.

4,101,733

ELECTRONIC DX SIGNALING CIRCUIT

Donald Edward Whitaker, Jackson, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 6, 1977, Ser. No. 794,335
Int. Cl.[2] H04L *25/02*
U.S. Cl. 178—58 R **3 Claims**



1. A trunk signaling arrangement for a telephone system for signaling over two conductors between a first and a second office using E and M signaling techniques, a duplex trunk circuit in each office, each trunk circuit including means for transmitting the condition of its M lead over one said two conductors to the other office, a resistive balance network in each trunk circuit for sensing the condition of its M lead and the potential difference between its M lead and the M lead of the trunk circuit at the other office, an electronic comparator circuit in one trunk circuit responsive to certain predetermined combinations of conditions from said network for switching an output circuit from a quiescent to an active condition, said comparator circuit comprising an operational amplifier having two input terminals and an output terminal, and in which two substantially identical resistances of said network are coupled between the M lead of said one trunk circuit and one input terminal of said comparator circuit and in which two substantially identical resistances of said network are coupled to the other input terminal of said comparator circuit.

4,101,734

BINARY TO MULTISTATE BUS DRIVER, RECEIVER AND METHOD

Tich T. Dao, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

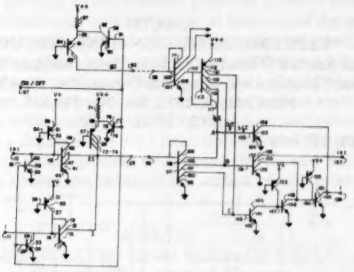
Filed Nov. 15, 1976, Ser. No. 741,874
Int. Cl.[2] H04B *1/00*
U.S. Cl. 178—68 **9 Claims**

1. A binary to multistate line driver and remote receiver comprising,

a line driver including

first and second injection logic encoder circuits having current injectors connected to receive respective first and second binary input signals for providing analog outputs at a signal output terminal in response to said input signals, said first and second encoder circuits comprising first and second input devices capable of summing predetermined input levels at the output terminal together with a predetermined threshold level source connected to said output terminal, said circuits each having current injectors with substantially similar structural characteristics,

a reference channel circuit connected to a reference terminal for providing a reference to the encoded signals, said reference circuit having a current injector with structural characteristics substantially similar to said encoder circuit current injectors,



a remote receiver having reference and signal inputs connected to the corresponding driver outputs, including

a reference level circuit for generating plural predetermined threshold reference levels from said reference signal,

an input circuit for receiving said input signals and generating plural replicated outputs therefrom,

a threshold detector circuit having two binary outputs and having plural input nodes with said predetermined threshold signal levels connected respectively thereto, and one of each replicated outputs further connected respectively thereto, so that the inputs at said nodes are compared and the threshold detector circuit provides a binary output from the encoded input signal which is a replica of the binary signal inputs.

4,101,735

TWO-WAY LOUDSPEAKING DEVICE FOR TELEPHONE STATIONS

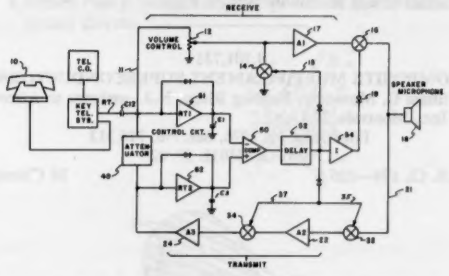
Edwin Redmond Bridenbaugh, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 591,455, Jun. 30, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,486

Int. Cl.[2] H04M *9/08*

U.S. Cl. 179—1 HF **7 Claims**

1. An audio signal controlled switching circuit for interfacing between a telecommunications system and a bidirectional transducer, said circuit including a first unidirectional audio path coupled at its input to receive audio signals from said system and coupled at its output to said transducer to transmit signals to said transducer, a second unidirectional audio path coupled at its input to the transducer and at its output to the system , swithing means for enabling transmission of signals through one or the other of said paths on operation thereof, a comparator network having a first and a second input means for comparing signals in said audio paths for operating the switching means responsive to audio signal received from said paths to enable the audio path from which signals of greater amplitude have been received by comparator network and to disable the other audio path, said first input means coupled to said system to continuously receive signals directed to said first audio path, said second input means coupled to the output of said second audio path to receive signals therefrom only with said first audio path disabled by said switching means whereby



to provide signals to said switching means to enable said first audio path on the occurrence of signals of greater amplitude from said system than those transmitted from said second audio path.

4,101,736

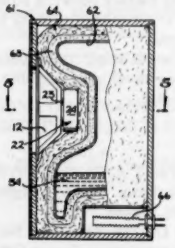
DEVICE FOR INCREASING THE COMPLIANCE OF A SPEAKER ENCLOSURE

Eugene J. Czerwinski, Studio City, Calif., assignor to Cerwin Vega, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 778,429, Mar. 17, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,709

Int. Cl.[2] H04R *1/28*

U.S. Cl. 179—1 E **6 Claims**



1. In a loudspeaker system an improvement for use in combination with a loudspeaker system which includes:

a. a vibratable cone having an open apex; and

b. a speaker enclosure having a top, a bottom, a back, a pair of sides and a front, the front having a speaker opening wherein the vibratable cone is mechanically coupled so that it may vibrate in response to an electrical signal, said improvement is a device for effectively enlarging the volume of the speaker enclosure in order to increase the compliance that the vibratable cone sees with said device comprising:

a. a gas having a gamma value less than 1.4 and the product of its density and the square of speed of sound therein less than the same product for air; and

b. a bag formed from a soft, pliable material for enclosing said gas within the speaker enclosure and adapted to seal said gas therein and to seal atmospheric gases and water thereout;

c. an acoustically transparent and porous cocoon disposed about said bag so that it surrounds completely said bag; and

d. an acoustical padding disposed adjacent to the top, the bottom, the back, the sides and the front of the enclo-

sure and adapted to enclose said acoustically transparent and porous cocoon.

4,101,737

CONTROL ARRANGEMENT IN A TIME-SPACE-TIME (T-S-T) TIME DIVISION MULTIPLE (T.D.M.) TELECOMMUNICATION SWITCHING SYSTEM

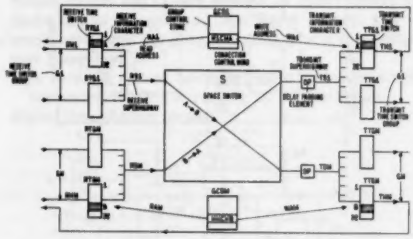
Alexander Schroder Philip, Liverpool, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 24, 1976, Ser. No. 699,449

Claims priority, application United Kingdom, Jun. 26, 1975, 27075/75

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **8 Claims**



1. A digital switching system of a time division multiplex telecommunications system which includes; a plurality (n) of m-channel multiplex receive-highways; a plurality (n) of m-channel multiplex transmit-highways; each of the receive-highways and transmit-highways including

a separate time-switch for storing information characters; and,

the receive-highways and transmit-highways are arranged in groups with each group connected to an individual receive-superhighway and transmit-superhighway respectively;

said receive-superhighways being interconnectable with the transmit-superhighways by a space-switching network providing duplex connection paths for the conveyance of information characters; and

each said duplex connection path comprises two separate simplex connection paths which are separated by time-slots which are (F/2) apart, where F is the number of time-slots in each superhighway frame; and,

a control arrangement including a separate control-store for the time-switches of each pair of superhighways constituted by a receive-superhighway and a transmit-superhighway, and each control-store includes a plurality of connection control-words and a single connection control-word is employed twice in a superhighway frame, once for controlling the reading of an information character from a time switch in a receive highway for conveyance over one simplex path and once for controlling the writing of the information character being conveyed over another simplex path into a time-switch in a transmit highway; and,

each said control-store has $n \times m$ storage locations for storing connection control words and is divided into two separate sections and the connection control-words for time-slots of an odd nomenclature are stored in one of the sections and connection control words for time-slots of an even nomenclature are stored in the other of the sections, and each control store includes an addressing means including;

a first counting-device for selecting connection control-words from the control-store to effect reading of information characters from the receive time switches; and,

a second counting-device for selecting connection control-words from the control-store to effect writing of information characters into the transmit time switches; and,

the first and second counting devices are operated in such manner that a phase difference F/2 + D, where F is the number of time-slots in a superhighway frame, and D is the propagation delay in the transmission of an information character over a simplex path, between the first and second counting devices of an odd number of time-slots is maintained by ensuring that the propagation delay D is an odd number of time-slots, by the said addressing means always addressing the separate sections of the connections control store concurrently.

4,101,738

ARRANGEMENT FOR PROCESSING AUXILIARY SIGNALS IN A FREQUENCY MULTIPLEX TRANSMISSION SYSTEM

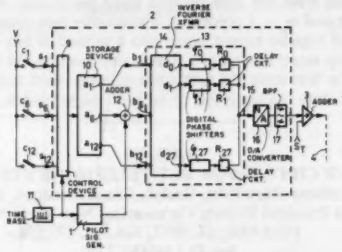
Maurice Georges Bellanger, Antony; Georges Bonnerot, Orsay, and Michel Coudreuse, Paris, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jun. 18, 1976, Ser. No. 697,357

Claims priority, application France, Jun. 24, 1975, 75 19717

Int. Cl.² H04J *1/14*

U.S. Cl. 179—15 FD **13 Claims**



1. An arrangement for processing spatially separated auxiliary signals for a given number of main information signals for transmitting these auxiliary signals together with the main information signals in an FDM format, said arrangement comprising a plurality of input circuit means for receiving said auxiliary signals, which plurality is equal to the number of main information signals, an output circuit, wherein the arrangement further comprises:

means coupled to said input means for digitizing the auxiliary signals, whereby said digital signals have a given bandwidth;

means which are coupled to said digitizing means for limiting the bandwidth of each of the auxiliary signals to less than said given bandwidth; and

a digital filter bank coupled to said limiting means and to said output means to which said digital auxiliary signals are applied and which has a passband characteristic which is characteristic for each of the auxiliary signals, the intermediate frequency of this characteristic coinciding with the intermediate frequency of the auxiliary channel for the relevant auxiliary signal.

4,101,739

DEMULTIPLEXER FOR ORIGINALLY SYNCHRONOUS DIGITAL SIGNALS INTERNESTED WORD-WISE

Horst Mueller, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 14, 1977, Ser. No. 759,351

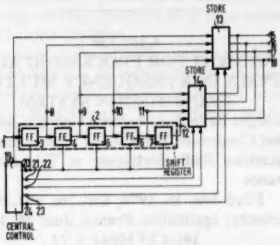
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602937

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 A **5 Claims**

4. The method of demultiplexing a synchronous word interleaved signal composed of m input signals with n bits for each

interleaved word having as a first step storing the input signal into a shift register of capacity $(m + 1)$. n bits with a tap after each n bits; having as a second step reading the first q bits of each of m words using the shift register input and $m - 1$ succeeding consecutive taps, counting from the shift register input point, into a first m bit wide by q bits deep store; having as a third step shifting the contents of the shift register another



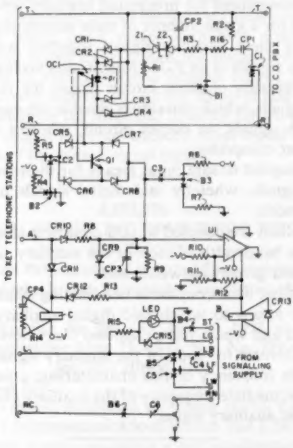
approximately $m \cdot n/2$ bits and reading the last r bits of each of m words from the shift register using the output of the shift register and $m - 1$ preceding consecutive taps counting from the shift register output point into a second m bits wide by r bits deep store; having as a fourth step reading out in parallel from the first store the first q bits of each word and from the second store the last r bits of each of the m words.

4,101,740

LINE CIRCUIT FOR KEY TELEPHONE SYSTEMS

John Anthony Barsellotti, Guelph, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,178
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 **7 Claims**



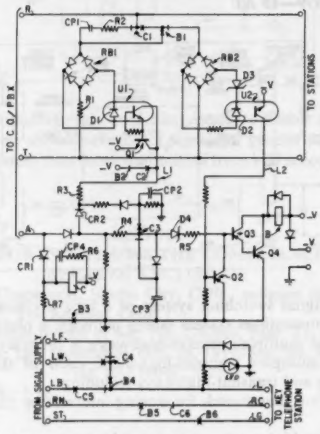
1. A line circuit for a line of a key telephone system including means for sensing ringing current, means responsive to the sensing of the ringing current for operating a control member to cause operation of a first relay, said first relay on operation controlling signaling to stations of the line, a second relay responsive to *a* seize ground signal from one station of said line indicative of an off-hook condition of said one station to operate and signal the stations of said line accordingly, means for maintaining said second relay operated for a timed period after removal of said seize ground signal, said ring sensing means operative to sense the level of line voltage across the conductors of said line during said timed period of operation of said second relay, said ring sensing means operative when said line voltage exceeds a predetermined voltage indicative of release of the off-hook condition at said one station for causing restoration of said second relay.

4,101,741

LINE CIRCUIT FOR KEY TELEPHONE SYSTEMS

George Kunstatter, Kitchener, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,041
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 **7 Claims**



1. A line circuit for a key telephone system which comprises a ring detecting means for causing operation of a first relay to initiate local signaling on occurence of ringing current applied to the line conductors, a second relay operated in response to an off-hook condition at a station of said line circuit, means for deenergizing said first relay in response to said off-hook signal, line voltage sensing means, means responsive to operation of said second relay for enabling said line voltage sensing means to determine the voltage across said line, said line voltage sensing means maintained in an off condition during off-hook and hold conditions, means for switching said voltage sensing means on in response to an open loop across said line conductors to prevent said first relay from operating and for preventing said line circuit from entering the hold condition.

4,101,742

AUDIO MESSAGE SYSTEM WITH PROGRAMMER

Edwin D. Craig, 3745 S. 250 West, P.O. Box 9255, Ogden, Utah 84409, and Ruel Ross Clark, Salt Lake City, Utah, assignors to Edwin D. Craig, Ogden, Utah

Filed Dec. 3, 1976, Ser. No. 747,070
Int. Cl.[2] G11B *15/18, 27/22, 31/00*
U.S. Cl. 179—100.1 C **15 Claims**

1. A programmable audio message system comprising:
a clock to generate intervaled timing pulses;
a plurality of audio message units, each of said units having:
control circuit means conductively connected to receive said intervaled timing pulses and to generate a start control signal upon receipt thereof,
tape player means conductively connected to receive said start control signal, said tape player having means to generate an audio signal and an audio output,
an audio detect circuit conductively connected
(1) to the audio output of said tape player to detect the presence of an audio signal and
(2) to supply a run and stop signal to said tape player

through said control circuit to cause said tape player to run as long as an audio signal is present at said audio output,

tape means for positioning on said tape player, said tape being preprogrammed with a plurality of brief audio messages;

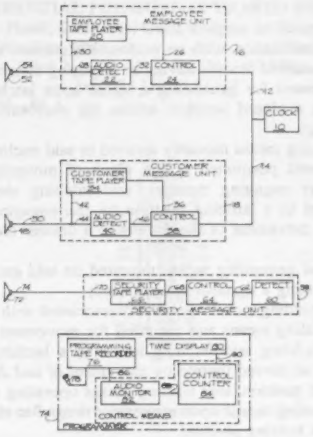
speaker means associated with each of said audio message units conductively connected to the audio output of its respective tape player to receive audio signals therefrom and generate corresponding audible signals;

wherein the intervaled timing pulses of said clock cause the control circuit of each message unit to start its respective tape player means in accordance with a time program to play the next brief audio message on said tape and the audio detect circuit of each respective message unit detects (1) the playing of the brief message at the audio output of its respective tape player to cause said tape player to run and (2) the absence of audio signals at the audio output to cause said tape player to stop; and

wherein said tapes are preprogrammed by a tape programmer comprised of:

tape recorder means havng an input with a microphone connected thereto to receive an audible input;

digital time display means;



control means conductively connected to said tape recorder means and to said digital time display means, said control means having:

a counter control circuit conductively connected to said time display means to supply signals thereto to cause said time display means to display a preselected time,

an audio monitor circuit conductively connected to detect the presence and absence of audio input to said tape recorder means and to send a pulsing signal to said counter control to advance the displayed time a preselected increment of time after detection of the presence of an audio input of selected duration followed by the absence of said audio input, said audio monitor circuit having means to inhibit recording for a selected period after the detection of said absence of said audio input.

10. Apparatus for programming cassette tapes for use with an audio message system having cassette tape recorders, said apparatus being comprised of:

a cassette tape recorder having an input with a microphone connected thereto to receive an audible input;

digital time display means;

control means conductively connected to said tape recorder means and to said digital time display means, said control means having:

a counter control circuit conductively connected to said time display means to supply signals thereto to cause said time display means to display a preselected time,

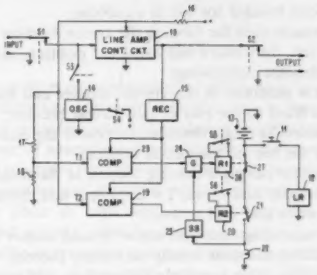
an audio monitor circuit conductively connected to detect the presence and absence of audio input to said tape recorder means and to send a pulsing signal to said counter control to advance the displayed time a preselected increment of time after detection of the presence of an audio input of selected duration followed by the absence of said audio input, said audio monitor circuit having means to inhibit recording for a selected period after the detection of said absence of said audio input.

4,101,743

TEST CIRCUIT FOR A PROTECTIVE COUPLER

Michel Leon Costes, and James Franklin Hoyle, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,837
Int. Cl.[2] H04M *3/26*
U.S. Cl. 179—175 **5 Claims**



1. A test circuit for use with a protective coupler used for coupling an output signal from a modem to a switched network and for limiting the maximum signal voltage applied to the network to a specified value comprising:

first switch means for disconnecting the coupler from the modem output and the network and for applying a signal having a voltage substantially in excess of the allowable network voltage to the input of the coupler,

circuit means for generating a first threshold voltage T1 corresponding to the maximum allowable signal voltage level permitted on the network and a second threshold voltage T2 corresponding to the signal voltage level applied by the first switching means to the coupler input,

an electrically operated indicator,

a first normally closed switch means and a second normally open switch means for connecting said indicator to an electric power source,

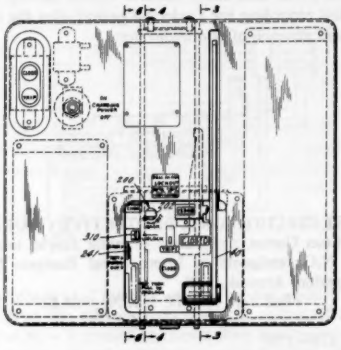
first comparator means responsive to the second threshold T2 and to the protective coupler output for providing an output to said second normally open switch means for causing said switch means to close and energize said indicator when the coupler output equals or exceeds T2, and

second comparator means responsive to the first threshold T1, the coupler output and the energization of said indicator for providing an output signal to said first normally closed switch means for causing said switch means to open and deenergize said indicator when said coupler output is equal to or less than T1 within a predetermined time period following the energization of the indicator.

4,101,744
CIRCUIT BREAKER RACKING MECHANISM FOR DRAWOUT TYPE SWITCHGEAR

George A. Wilson, Pineville, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 22, 1976, Ser. No. 734,955
Int. Cl.[2] H01H 9/20
U.S. Cl. 200—50 AA 8 Claims

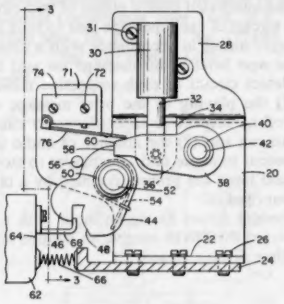


1. In a circuit breaker for use in a cubicle;
a racking mechanism for moving the circuit breaker to connected, test, disconnect and draw out position, said racking mechanism comprising:
a lead screw mounted in the circuit breaker and extending from the front to the rear of said circuit breaker;
said lead screw having a threaded section at the end thereof adjacent the rear of the circuit breaker;
said lead screw having a driving section at the front of the circuit breaker and means for engaging said driving section to rotate said lead screw;
means for mounting said lead screw in said circuit breaker and retaining the same axially stationary therein;
said lead screw being angularly rotatable in said mounting;
a travelling nut on the threaded section of said lead screw;
guide means for the said travelling nut maintaining said travelling nut against rotation with said lead screw and causing said travelling nut to move longitudinally of said lead screw when said lead screw is rotated;
a cam roller carrying bracket pivotally mounted in said circuit breaker;
a link connecting said cam roller carrying bracket and said travelling nut;
said cam roller carrying bracket rotating in one direction when said travelling nut moves in one direction and in an opposite direction when said travelling nut moves in an opposite direction;
a cam roller mounted on said cam roller carrying bracket; said cam roller being moved by said cam roller carrying bracket in a vertical direction between a rack out position wherein the cam roller is in a position to permit withdrawal of the circuit breaker from said cubicle and insertion thereof into said cubicle and a fully racked in position wherein said circuit breaker is fully inserted into said cubicle;
said cubicle having a back wall and a front;
the back wall of said cubicle having a plurality of stationary disconnect contacts;
the rear of said circuit breaker having corresponding circuit breaker disconnect contacts;
and means in said cubicle cooperating with said cam roller; engagement of said cam roller with said corresponding means and movement of said roller with respect to said cooperating means causing said circuit breaker to move between the drawout position and the connected position.

4,101,745
DRAWER OPERATED SWITCH ASSEMBLY

Gerald P. Smith, Dagsboro, Del., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 11, 1977, Ser. No. 786,696
Int. Cl.[2] H01H 3/16
U.S. Cl. 200—61.61 16 Claims



1. In combination with an enclosure structure including a slidably mounted drawer having an engaging member secured thereto, means for generating a signal upon latching of the drawer in a closed position within the enclosure structure comprising:
(a) latching means movably secured to said enclosure structure and positioned in the plane of movement of the drawer engaging member, said latching means being moved to a latching position by the engaging member upon movement of the drawer in a drawer closing position;
(b) signal generating means mounted on said enclosure for generating a signal when operated;
(c) and holding means operatively associated with said signal generating means and mounted for movement to a position holding said latching means in a latching position when so moved thereto by movement of said drawer to a closed position, said holding means operating said signal generating means upon movement thereof to the latching means holding position.

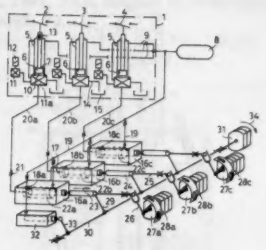
4,101,746
APPARATUS FOR CONTROLLING THE DRIVE FOR HYDRAULICALLY ACTUATED HIGH-VOLTAGE POWER CIRCUIT BREAKERS

Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 14, 1976, Ser. No. 723,204
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2543107
Int. Cl.[2] H01H 35/38
U.S. Cl. 200—82 B 6 Claims

1. Control apparatus for controlling the drive of a high voltage circuit breaker including a number of hydraulically actuated circuit breaker units, said control apparatus comprising:
a number of hydraulically actuated position signal transmitter means each including means adapted to be connected to a different circuit breaker unit;
a number of freewheel clutches each connected to a different one of said signal transmitter means;
control switch means responsive to each said signal transmitter means for permitting transmission of an off command to a breaker unit only when all of said signal transmitter means are in an on position or an off position, said switch means being connected in series with each said transmitter

means and including an actuating means connected to said clutches;



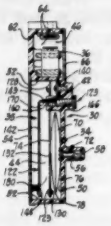
and accumulator means for continuously loading said switch means with a force which acts to bias said switch means in the off direction.

4,101,747

DIFFERENTIAL PRESSURE OPERATED SWITCH

William J. Houk, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Jan. 30, 1976, Ser. No. 653,899
Int. Cl.² H01H *35/32*
U.S. Cl. 200—83 A **10 Claims**



1. A differential pressure responsive control device comprising:

(a) a support housing;

(b) a control switch member supported by said support housing and movable relative to said housing between first and second positions, said member defined by a thin sheet of electrically conductive material cantilevered to said housing and resiliently deflectable between said positions, said member biased toward said first position;

(c) a bladder operatively interposed between said member and said housing to effect movement of said member to said second position from said first position, said bladder formed at least in part by supple film material and constructed and arranged to be inflatable up to a predetermined volume without resiliently deforming the film material;

(d) conduit means for communicating the interior of said bladder to a source of fluid so that the bladder is inflated toward said predetermined volume when the fluid pressure level in said bladder exceeds the pressure ambient said bladder;

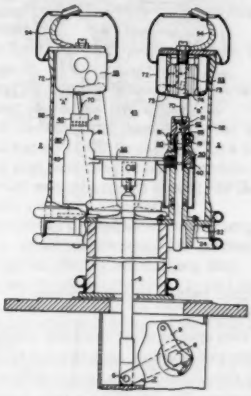
(e) said member defining a major face confronting said bladder and said supple film material of said bladder engaging and conforming to said member face so that differential pressure force is applied to said member for moving said member to said second position when the volume of said bladder is substantially less than said predetermined volume.

4,101,748

MODULAR PUFFER-TYPE CIRCUIT-INTERRUPTER UNIT ADAPTABLE FOR DIFFERENT VOLTAGE AND CURRENT RATINGS

Jeffry R. Meyer, Penn Hills Township, Allegheny County, and Robert L. Hess, North Versailles, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1976, Ser. No. 685,466
Int. Cl.² H01H *33/82, 9/30*
U.S. Cl. 200—148 A **6 Claims**

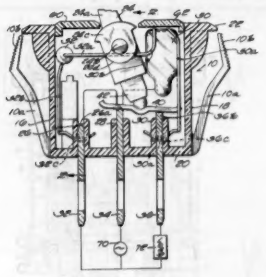


1. A gas-blast circuit-interrupter comprising, in combination, means defining a grounded metallic tank, a pair of terminal-bushings extending into said grounded metallic tank and carrying a pair of spaced interiorly-disposed line-terminal connections at the inner ends thereof, at least one modular-type puffer-interrupting unit disposed within said tank, a metallic supporting plate at high voltage (**186**) disposed within said grounded metallic tank for fixedly supporting said modular-type puffer-interrupting unit, insulating supporting means (**95**) for supporting said metallic support-plate (**186**) within said tank an adequate insulated distance from the inner walls of said grounded metallic tank, means defining a stationary contact structure (**53**) having a flexible line-connector (**110**), a side insulating bridging baffle-plate for solely fixedly supporting the stationary contact structure from said metallic supporting plate (**186**), means defining a fixed piston structure (**50**) supported from said metallic supporting plate (**186**), means defining a movable contact assemblage comprising an insulating hollow nozzle, a movable contact and a movable operating cylinder with the latter slidably moving over said relatively-fixed piston structure for the compression of gas therebetween, said movable contact being cooperable with said relatively-stationary contact structure (**53**) to establish an arc (**70**) through said insulating hollow nozzle (**21**), the gas compressed between the movable operating cylinder and the stationary piston structure passing through said hollow nozzle (**21**) adjacent the established arc (**70**) to effect the extinction thereof, operating-rod means for actuating the movable contact structure reciprocally operable through said metallic supporting plate (**186**) for effecting the opening and closing operations of said modular-type puffer-interrupting unit, means electrically connecting said flexible terminal-lead (**110**) with one of said two terminal-bushings, means electrically connecting the movable contact structure to the line-terminal connection of the other terminal-bushing, and said side insulating bridging baffle-plate not only serving as the sole supporting means for the relatively-stationary contact structure (**53**) but, additionally, preventing the lateral dispersion of the emanated hot arcing gases from reaching the inner side metallic tank wall which would tend to promote voltage flashover.

4,101,749
ELECTRICAL ATTACHMENT OF INDICATING LAMP TO TERMINALS IN ELECTRIC SWITCHES

Leonardus J. Josemans, Smithfield, N.C., and John A. Swessel, Jr., Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 15, 1976, Ser. No. 750,969
Int. Cl.[2] H01H 9/00
U.S. Cl. 200—317 5 Claims



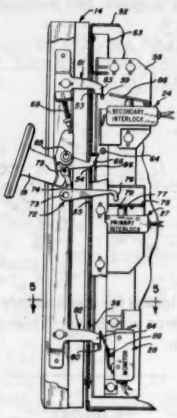
1. In an electric switch, in combination:
(a) a switch housing,
(b) at least two spaced apart inwardly extending boss portions within said housing, each thereof having an aperture extending therethrough to an outer surface of the housing and a transversally extending notch formed at its inner end,
(c) terminal members secured in place within the apertures in said boss portions and extending outwardly of said housing, each of said terminals being provided with a transverse aperture which is partially aligned with the bottom end of said notch in its associated boss portion, and
(d) an electric indicating lamp mounted in said housing and having lead means extending through said notches in said boss portions and anchored in good electrical conducting relation with said terminal members between the bottom ends of said notches and the margins of the transverse terminal apertures.

4,101,750
DOOR INTERLOCK SYSTEM FOR MICROWAVE OVEN

John T. Doner, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 31, 1977, Ser. No. 801,832
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 C 29 Claims

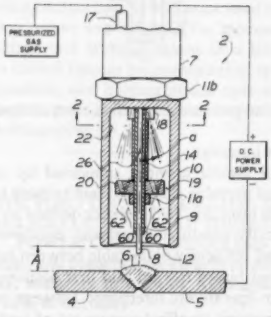
1. In a microwave oven having a cabinet defining an oven cavity having a front opening, a door movably mounted to said cabinet for selectively closing said opening, electrically operable microwave energy generating means for supplying electromagnetic energy to said cavity, and an electrical circuit including switch means for providing electric power from an external source to said electrically operable means, improved means for selectively securing said door in a closed position wherein the door closes said opening, and selectively operating said switch means, said improved means comprising:
a slider member movably mounted to said cabinet for movement beteen released and interlocking positions;
catch means movable with said slider member; and
interlock means including an operator member for selectively moving said slider member to said interlocking position with said door disposed in said closed position, latch means carried by said door and engageable with said catch means with said door disposed in said closed position and as a result of said slider member being disposed in said interlocking position, and actuator means operable substantially concurrently with said latch means for operating said switch means to permit operation of said generating means only when said door is latched in said closed position.



4,101,751
APPARATUS AND METHOD FOR INERT GAS ARC WELDING

John M. Urbanic, Pittsburgh, and Burney A. Major, Spring Church, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 3, 1977, Ser. No. 803,022
Int. Cl.[2] B23K 9/16
U.S. Cl. 219—74 12 Claims

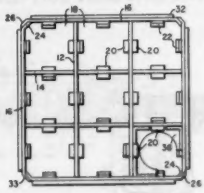


1. An arc welding device including,
an elongated cup being substantially closed at its distal end and being substantially open at its proximal end,
inlet means adjacent the distal end of the cup for introducing gas into the cup,
electrode means disposed inside said cup and extending axially thereof,
diffuser means disposed partway along the axis of said cup between said inlet means and said open end of the cup,
said diffuser means having at least one set of passageways therein having their axes inclined away from the longitudinal central axis of the cup, and
at least one other set of passageways having their axes inclined toward said longitudinal central axis,
the two sets of passageways alternating with one another for creating two sets of gas columns passing by but not intersecting one another.

4,101,752
PROCESS FOR WELDING CORNER CELLS IN FUEL ASSEMBLY GRIDS

Robert Duncan, Fork, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1976, Ser. No. 723,271
Int. Cl.[2] B23K *11/10*
U.S. Cl. 219—91.2 **4 Claims**

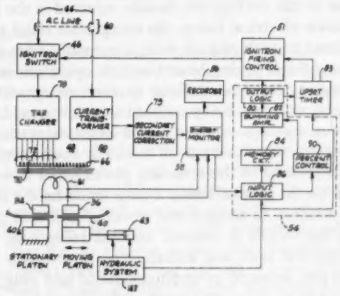


1. A process for welding framing members of a grid for a nuclear reactor fuel assembly comprising the steps of:
- assembling a fuel assembly grid by interleaving straps having dimples and springs thereon to form a grid of egg crate configuration;
- placing frame members peripherally around said interleaved grid so that the end of adjacent members overlap one another;
- placing said grid in a fixture;
- inserting in each of the grid corner cells a tool having outside dimensions equal to the inside dimensions of the corner cells and having an opening therein which is located in alignment with the overlapping frame member ends;
- moving said fixture with its enclosed grid and tool onto a welding electrode so that the electrode tip extends through the tool opening and engages the overlapping frame ends;
- moving an electrode of opposite polarity into contact with said overlapping ends and opposite said first electrode to thus spot weld said overlapping ends; and
- removing said fixture from the welding apparatus.

4,101,753
FLASH WELDING APPARATUS AND METHOD

Grier E. Buff, Gadsden, and Talmadge V. Phillips, Ragland, both of Ala., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 30, 1976, Ser. No. 653,837
Int. Cl.[2] B23K *11/04*
U.S. Cl. 219—97 **7 Claims**

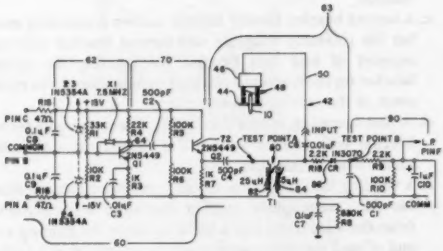


1. A system for executing a welding cycle including a flashing step and an upset step for flash welding together workpiece surfaces, the system comprising:
- (a) apparatus for executing an initial flashing step comprising:
  - (i) apparatus for moving the workpiece surfaces toward each other, and
  - (ii) means for applying electrical energy between the workpiece surfaces during such motion to cause flash heating of the surfaces;
- (b) apparatus for continuously monitoring the amount of electrical energy applied during the welding cycle, including during the flashing step, by producing a total energy output signal continuously representing the instantaneous time integrated electrical power applied during the welding cycle; and
- (c) apparatus for subsequently executing an upsetting step, comprising:
  - (i) apparatus for forcing the workpiece surfaces together subsequent to the flashing step; and
  - (ii) control circuitry for continuing the application of electrical energy to the workpieces for a time during the upsetting step, said time being a function of the amount of electrical energy applied during the flashing step,
- (d) said control circuitry comprising:
  - (i) memory circuitry responsive to the energy monitor for storing a signal representing the amount of electrical energy applied during the flashing step;
  - (ii) comparing circuitry connected to said energy monitor and said memory circuit for indicating the value of the stored signal relative to that of the total energy output signal, and
  - (iii) output logic circuitry responsive to the comparing circuitry for terminating the electrical energy application when the comparing means indicates that the value represented by the energy monitor total energy output signal exceeds the value represented by the stored signal by a predetermined function of the stored signal value.

4,101,754
ADJUSTING CIRCUIT FOR USE IN PLASMA ARC CUTTING TORCH

Robert L. Fischer, Huntington, W. Va., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,605
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—121 P **18 Claims**



1. In a plasma arc torch cutting assembly including a control circuit for automatically controlling the height of a plasma arc torch above a metal work piece to be cut; said cutting assembly including a water muffler assembly for reducing noise and fumes generated by the cutting torch; said control circuit including a reference voltage circuit having means for manually setting the desired height of the plasma torch above the work piece, and a detector circuit which senses the height of the plasma torch above the work piece based on the difference in control capacitance between the work piece and a sensor located adjacent said plasma torch; said reference voltage circuit and said detector circuit being fed into a differential amplifier; said differential amplifier connected to means for varying the height of said plasma arc torch; the improvement

wherein the reference voltage circuit includes an adjusting circuit which takes into account the effect of water on the work piece which caused a significant change in said control capacitance; said adjusting circuit including means for varying the reference voltage applied to said differential amplifier to compensate for the change in the detector circuit voltage caused by the change in said control capacitance caused by water on the work piece.

4,101,755

AUTOMATIC ARC WELDER

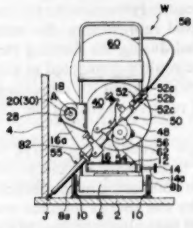
Takafumi Uratani, Osaka, Japan, assignor to Osaka Transformer Co., Ltd., Osaka, Japan

Filed Feb. 3, 1977, Ser. No. 765,406

Claims priority, application Japan, Feb. 13, 1976, 51-15015[U]; Feb. 13, 1976, 51-15016[U]; May 14, 1976, 51-60103[U]

Int. Cl.[2] B23K *9/12*

U.S. Cl. 219—124.31 **23 Claims**



1. An automatic arc welder capable of performing various types of weldings such as non-positioned fillet welding, horizontal welding and flat positioned welding, through continuous feeding of electrode wire extracted from a wire drum onto a joint formed between two metal plates, said automatic arc welder comprising;

a. a carrier member having means for traveling said carrier member along the joint;

b. a first bracket mounted on said carrier member, said first bracket having formed therein a support at an end portion thereof;

c. a second bracket having formed therein a coupling member for rotatably coupling said second bracket onto said support of said first bracket for rotating the second bracket on an imaginary plane perpendicular to the movement of the carrier member;

d. a first clamping means for tightly clamping said second bracket with respect to said first bracket at a predetermined rotated position;

e. a welding unit including an electrode wire feeding member for continuously feeding electrode wire extracted from the wire drum and a welding torch for guiding a tip end of said electrode wire towards an end of and further outside of said welding torch, said welding unit rotatably supported with respect to said second bracket on said imaginary plane for changing directing direction of said welding torch; and

f. a second clamping means for tightly clamping said welding unit with respect to said second bracket at predetermined rotated position, whereby tip end of said welding torch, upon rotation of said second bracket into said first described predetermined position with respect to said first bracket and upon rotation of said welding unit into said latter described predetermined position with respect to said second bracket, can be positioned adjacent to said joint and can be directed towards the joint for effecting said various types of weldings.

4,101,756

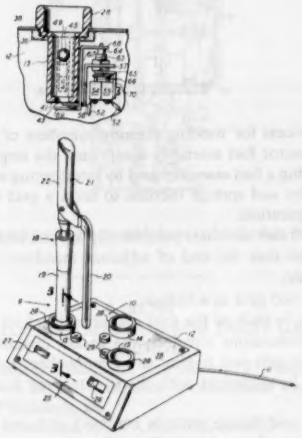
ELECTRICALLY HEATED CURLING IRON AND STAND THEREFOR

Jiichi Yamano, 288 2-chome Nishiokubo, Shinjuku-ku, Tokyo, Japan

Filed Mar. 18, 1976, Ser. No. 667,894

Int. Cl.[2] H05B *1/00*; A45D *1/04*

U.S. Cl. 219—222 **1 Claim**

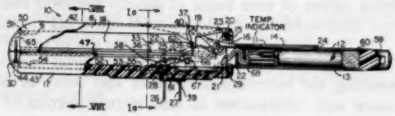


1. Hair curling apparatus comprising in combination at least one hair curling iron having a hair mandrel, a heat insulating handle, an electrically energized heating element enclosed in the curling iron and heat-conductively joined to the mandrel of the curling iron, electrically and spatially separated electrical contact zones on the curling iron handle remote from said mandrel electrically connected to the heating element, an electrically energizable stand, at least one receptacle on said stand, each adapted to receive the handle of one of said at least one curling iron for supporting the curling iron in the stand, electrically and spatially separated contact poles in each receptacle adapted to make electrical contact each with a separate contact zone on the curling iron handle received in the receptacle, a separate electrical line in the energizable stand electrically connected to each contact pole, a normally open switch having conventional spring-biased switch operators in each electrical line, a lesser beam fixed to each receptacle, said normally open switches being secured in pairs to said lesser beam, an actuating pin journalled in said lesser beam to engage the switch operators of said pair of normally open switches, a greater beam secured to the actuating pin to move therewith, a lower arm on the greater beam; a plug shank on the curling iron handle adapted to contact said lower arm of said greater beam when the handle is inserted into the receptacle, and a spring leaf integral with said actuating pin to transmit thrust between the pin, actuated by impingement of said plug shank on the lower arm of the greater beam, and the switch operators of said pair of switches to close the switches the greater beam being movable from the switch closing position upon removal of the curling iron handle from the receptacle, under the thrust of the spring-biased switch operators.

4,101,757
COLLAPSIBLE PORTABLE ELECTRIC HAIR CURLING IRON

Kenneth Arthur Van Dyck; James Bartlett Wyatt, both of Westport; Charles Francis Stephenson, Rowayton, and Scott William Miller, Stratford, all of Conn., assignors to The Gillette Company, Boston, Mass.

Filed Jul. 8, 1976, Ser. No. 703,581
Int. Cl.[2] A45D *1/04*; H05B *3/06*; H01R *11/02*
U.S. Cl. 219—225 **26 Claims**



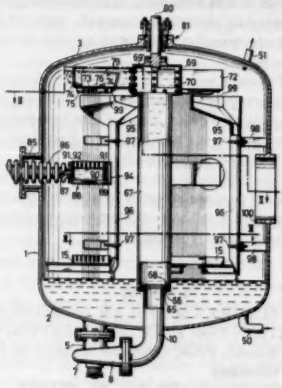
1. A curling iron comprising:
a hollow handle having an open end;
heat conducting means arranged in said handle for telescopic movement therein between a first position projecting from said handle and a second position substantially enclosed within said handle;
an electric heat generating element associated with said heat conducting means for heating said heat conducting means; and
electrical connector plug means electrically connected to said heat generating element and adapted to connect said heat generating element to an external source of power, said plug means being coupled to said heat conducting means for movement therewith and having bearing means projecting from said plug means for cooperating with means on said handle for moving said plug means between a first plug position projecting from said handle for conducting electrical energy to said heat generating element when said heat conducting means is in said first positon and a second plug position substantially entirely within said handle when said heat conducting means is in said second position in response to movement of said heat conducting means between said first and second positions.

4,101,758
ELECTRIC STEAM GENERATOR HAVING A MOVABLE DISTRIBUTION MEANS

Brinton Sprague, Bainbridge Is., Wash., assignor to Cam Industries, Inc., Kent, Wash.

Filed Dec. 29, 1976, Ser. No. 755,200
Claims priority, application Switzerland, Jul. 13, 1976, 4989/76
Int. Cl.[2] H05B *3/60*; F22B *1/30*
U.S. Cl. 219—285 **8 Claims**

1. In an electric steam generator, the combination comprising
a vessel;
at least one horizontally extending dish-shaped stationary electrode in said vessel for receiving and heating a supply of water and having openings therein forming outlets for the received water to form vertical water jets;
a horizontally movable water distribution means located above each of said at least one electrode for movement relative to each of said at least one electrode in a range between a first position corresponding to a partial load on the generator and a second position corresponding to a full load on the generator, said distribution means having a chamber to receive water, said chamber including a horizontal bottom having a group of openings above each of said at least one electrode for directing vertical water jets against and into each of said at least one electrode; and,
a water collecting means mounted in stationary manner in said vessel in a horizontal plane between said distribution means and each of said at least one electrode, said collecting means being vertically disposed below at least a portion of said distribution means when said distribution means is within said range and vertically out of alignment

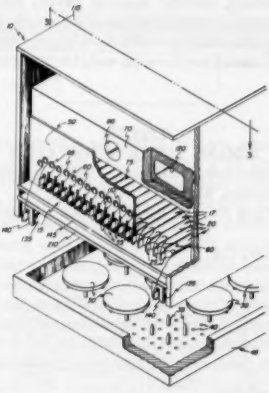


with each of said at least one electrode for collecting that portion of the water not directed at each of said at least one electrode.

4,101,759
SEMICONDUCTOR BODY HEATER

Thomas R. Anthony; Harvey E. Cline, both of Schenectady; John O. Fielding, Ballston Lake, and Carl A. Erikson, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,512
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—343 **17 Claims**



1. A heater for processing one or more bodies of semiconductor material by temperature gradient zone melting, said heater comprising:
a planar array of radiant heating elements, having two opposed sides and said array being oriented in a plane parallel to the one or more bodies of semiconductor material;
means for mounting said radiant heating elements wherein each of said radiant heating elements is individually removable and replaceable without disengaging any other radiant heating element from said mounting means;
said means for mounting said radiant heating elements comprises first and second terminal plates, each of said terminal plates being slotted in a plurality of locations along one

edge thereof, said slots accommodating the ends of said radiant heating elements and having cooling gas passages therethrough located between said ends of said radiant heating elements to provide a longitudinal means for cooling each of the elements, said terminal plates including a plurality of electrical terminals, each of said terminals being electrically connected to one of said radiant heating elements;

a reflector, disposed parallel to and spaced from one side of said planar array of radiant heating elements, said reflector being provided with internal cooling passages and a polished reflective surface and including first and second sides and first and second ends, and

said internal coolant passages within said reflector comprise a first coolant passage adapted to accommodate a flow of cooling gas and a second coolant passage adapted to accommodate a flow of liquid coolant.

4,101,760

REFRACTORY GRANULAR EMBEDDING COMPOSITION FOR ELECTRIC HEATING COILS

Hanno Roller, Kandel, Pfalz, Germany, assignor to Firma Fritz Eichenauer, Germany

Filed Apr. 5, 1976, Ser. No. 673,527

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1975, 2514578

Int. Cl.[2] H01B *3/46, 3/12;* H05B *3/48, 3/18*

U.S. Cl. 219—544 **15 Claims**

1. A refractory, granular, electrically-insulative composition suitable for use as an embedding composition for electric heating coils, which composition comprises fused and granulated, high-melting, ceramic material having solid granulated polyalkylsiloxane or polyarylsiloxane admixed therewith in a proportion of from 0.5 to 5.0% by weight, expressed as an added weight, based on the weight of the ceramic material.

13. An electrical heating element comprising a housing and an electric heating coil which is embedded in a refractory, granular, electrically-insulative composition contained within said housing which composition comprises fused and granulated, high-melting, ceramic material having solid granulated polyalkylsiloxane or polyarylsiloxane admixed therewith in a proportion of from 0.5 to 5.0% by weight, expressed as an added weight, based on the total weight of the ceramic material.

4,101,761

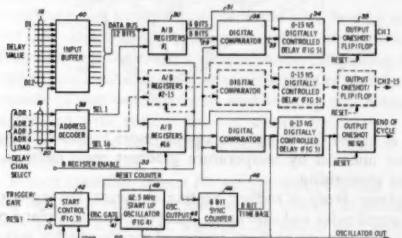
TIMING PULSE GENERATOR

Wayne R. Merryman, Lafayette, Calif., assignor to Pacific Western Systems, Mountain View, Calif.

Filed Nov. 26, 1976, Ser. No. 745,283

Int. Cl.[2] G06M *3/02*

U.S. Cl. 235—92 CA **7 Claims**



1. In a timing circuit:

register means for registering a word having a first portion and a second portion and for providing said word at an output of said registering means;

a counter for providing an output;

clock means stepping said counter in predetermined increments of time through a plurality of states;

comparator means responsive to said counter output and to said first word portion of said output of said registering means for comparing said first portion of said word and the state of said counter and for generating a comparator output at an output of said comparator means when the two coincide; and

variable delay means having a plurality of predetermined selectable incremental delay values of time independent of said time increments of said clock means, said incremental delay values of time being of shorter duration than the time increments of said clock means and being responsive to the output of said comparator means and to said second portion of said output word of said register means for selecting the incremental value of said delay in accordance with information in said second portion of said word and for producing a timing pulse output at the end of said selected incremental amount of said delay

the starting time of said timing pulse output being thereby specified by information in said first portion of said word output of said register means and as further incrementally delayed in accordance with information in said second portion of said word.

4,101,762

RECORDING DISTANCE MEASURING INSTRUMENT AT VEHICLE WHEEL HUB

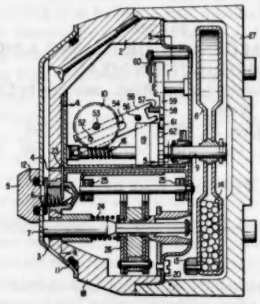
Carl Gote Lennart Borgstrom, Svangsta, Sweden, assignor to AB Record Taxameter AB, Halmstad, Sweden

Continuation-in-part of Ser. No. 549,702, Feb. 13, 1975, abandoned, and a continuation-in-part of Ser. No. 612,208, Sep. 10, 1975, Pat. No. 4,083,489. This application Jun. 14, 1976, Ser. No. 695,394

Claims priority, application Sweden, Feb. 27, 1974, 7402578; Australia, Feb. 21, 1975, 78449/75; Canada, Feb. 26, 1975, 220850; Denmark, Feb. 26, 1975, 766/75; United Kingdom, Feb. 27, 1975, 8197/75; Finland, Feb. 24, 1975, 750511

Int. Cl.[2] G01C *27/00*

U.S. Cl. 235—95 C **4 Claims**



1. In a device attached to a vehicle hub for recording distances covered by the vehicle, wherein the device includes a counting mechanism having wheels that advance as the hub rotates, the improvement comprising:

a housing secured in fixed relation to said hub for containing said device and supporting said counting mechanism for rotation with said hub;

a shaft rotatably mounted in said housing for free rotation relative to each of said housing, said hub and said counting mechanism;

means for coupling said shaft to said counting mechanism to rotate the wheels of said counting mechanism, upon relative rotation between said shaft and said counting mechanism;

annular pendulum means non-rotatably secured to said shaft and tending to hold said shaft stationary with respect to said mechanism, said housing and said hub as said hub rotates;

an annular chamber within said pendulum means for holding a plurality of loose metal balls having a radial depth substantially less than the radial depth of said annular pendulum means, said loose metal balls moveable relative to said pendulum to change the center of gravity thereof, upon applying a vertical impact to the hub, so that the pendulum rotates; and

means fixed to said pendulum for returning said pendulum to essentially the same position, with respect to said hub, after the vertical impact has occurred, and to prevent the pendulum from slowly migrating, when subjected to vibration forces.

4,101,763

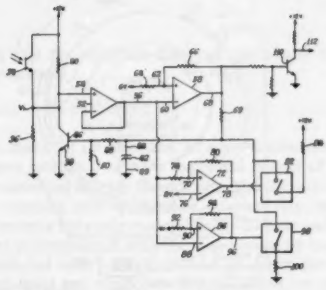
CONTROL SYSTEM FOR AN IMAGE DETECTOR

John R. Flint, Barrington, and K. George Rabindran, Lincolnwood, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 3, 1977, Ser. No. 803,019

Int. Cl.² H01J *39/12*

U.S. Cl. 250—214 R **14 Claims**



1. In an image detector having a light source, a light sensitive element disposed to receive light generated by the light source for generating a current proportional to the level of light incident thereon, and an image path along which an image bearing element is conveyed adjacent the light sensitive element for varying the light incident upon the light sensitive element in response to the presence and absence of an image, a control system for generating an image location voltage of a first predetermined level in the absence of an image and an image location voltage of a second predetermined level in the presence of an image, the control system comprising:

impedance means receiving the current from the photosensitive element for generating an image location voltage;

a variable current source having an output coupled to said impedance means and an input;

a charge storing element coupled to the input of said variable current source, said variable current source generating a current proportional to the level of charge on said charge storing element for varying its current output and thereby the level of said image location voltage;

first means responsive to the image location voltage exceeding a selected voltage level intermediate the intended first and second predetermined levels for discharging said charge storing element and raising the level of the image location voltage above the first predetermined level, and responsive to the image location voltage being below the selected voltage level for charging said charge storing element and lowering the level of the image location voltage below the second predetermined level;

second means responsive to the image location voltage exceeding the first predetermined level for charging said charge storing element and lowering the image location voltage below the first predetermined level;

third means responsive to the image location voltage being below the second predetermined level for discharging said charge storing element and raising the image location voltage above the second predetermined level,

whereby, when the image location voltage is intermediate the selected voltage level and the first predetermined level, said first means discharges said charge storing element and raises the image location voltage above said first predetermined level, whereupon said second means and said first means then alternately charge and discharge said charge storing element for alternately lowering and raising the image location voltage about the first predetermined level, and when the image location voltage is intermediate the selected voltage level and the second predetermined level, said first means charges the charge storing element to lower the level of the image location voltage below the second predetermined level, whereupon said third means and said first means alternately discharge and charge said charge storing element for alternately raising and lowering the image location voltage about the level of the second predetermined level to maintain the average level of the image location voltage substantially equal to the second predetermined level.

4,101,764

INCREMENTAL MEASURING SYSTEM

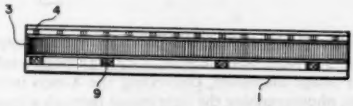
Günther Nelle, Siegsdorf, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 719,847

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540412

Int. Cl.² H01J *3/14*

U.S. Cl. 250—237 G **7 Claims**



1. In an incremental measuring system, including a grid scale, an electronic counter, a plurality of fixed reference marks along the grid scale, and a movable sensor means for generating an electric impulse in conjunction with the reference marks for control purpose use by the electronic counter, the improvement comprising a series of movable selection indicators adjustable along the grid scale for association with each of the fixed reference marks needed for control purposes, and a switch means for cooperating with the adjustable selection indicators to prevent electric impulses generated by the sensor means, in conjunction with reference marks not associated with a selection indicator, from reaching the electronic counter.

4,101,765

MEANS FOR COUNTERACTING CHARGED PARTICLE BEAM DIVERGENCE

Edwin B. Hooper, Jr., Danville, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

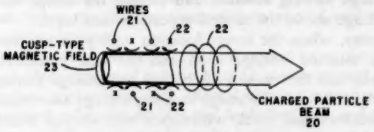
Filed Jul. 19, 1976, Ser. No. 706,402

Int. Cl.² G01N *27/78*

U.S. Cl. 250—251 **7 Claims**

1. In combination with a neutral beam-generating system composed of a low energy beam section, an ion accelerator aligned to receive a beam from said low energy beam section, and a charge exchange cell aligned to receive the output from

said accelerator; apparatus for counteracting charged particle beam divergence comprising means for forming a cusp-type magnetic field positioned about an associated neutral beam,



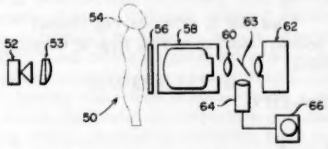
said magnetic field forming means being positioned in said low energy beam section of said neutral beam-generating system for deflecting and redirecting particles tending to diverge from a desired beam direction.

4,101,766

X-RAY IMAGE INTENSIFIER PHOTOFLUOROGRAPHY APPARATUS FOR CORRECTING THE BRIGHTNESS OF THE OUTPUT IMAGE

Hiroshi Minami, Yokohama; Norio Harao, Koza, and Takuji Tsuneoka, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 3, 1977, Ser. No. 756,003
Claims priority, application Japan, Jan. 10, 1976, 51-2191
Int. Cl.[2] G03B *5/17*
U.S. Cl. 250—320 **8 Claims**



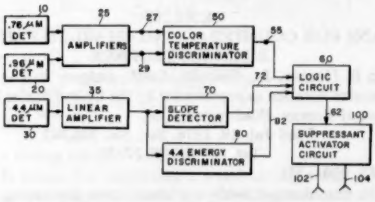
1. An X-ray image intensifier photofluorography apparatus for emitting X-rays from an X-ray source through a subject to an X-ray image intensifier, converting the X-rays into amplified light, photographing the light image through a lens system in an optical camera, and correcting the brightness of the output image, wherein X-ray distribution-correcting filter means whose X-ray permeability is represented by an axially asymmetric form relative to the horizontal axis is disposed between the X-ray source and X-ray image intensifier.

4,101,767

DISCRIMINATING FIRE SENSOR

John W. Lennington, Bellville, and Donald M. Szeles, Ann Arbor, both of Mich., assignors to Sensors, Inc., Ann Arbor, Mich.

Filed May 20, 1977, Ser. No. 798,801
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—339 **20 Claims**



1. A discriminating fire sensor comprising:

first circuit means for detecting the color temperature of a fire and providing an output signal indicating that the color temperature of a fire is above or below a predetermined level;

second circuit means for detecting the energy level of a hydrocarbon fire and for providing a control output signal when the detected level is above a predetermined threshold and increasing at a predetermined rate; and

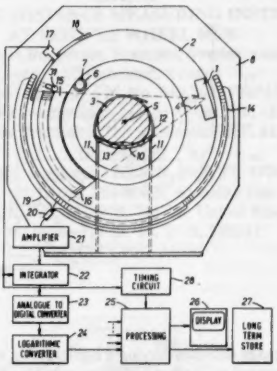
logic circuit means coupled to said first and second circuit means and responsive to signals therefrom for providing a suppressant activating signal only in response to a control signal from said second circuit means and when the signal from said first circuit means indicates the color temperature of the fire is below said predetermined level.

4,101,768

APPARATUS FOR COMPUTERIZED TOMOGRAPHY HAVING IMPROVED ANTI-SCATTER COLLIMATORS

Brian Herbert Lill, Flackwell Heath, England, assignor to EMI Limited, Hayes, England

Filed Feb. 28, 1977, Ser. No. 772,688
Claims priority, application United Kingdom, Mar. 3, 1976, 8417/76
Int. Cl.[2] A61B *6/00*; G01N *23/08*
U.S. Cl. 250—360 **8 Claims**



1. Radiographic apparatus including a source adapted to project a fan-shaped spread of penetrating radiation through a slice of the body of a patient, means for causing said source to effect at least an angular movement, relative to the body, about an axis intersecting the slice so as to project the radiation through the body from a plurality of directions, a plurality of detector devices disposed to receive the radiation after projection through the body and a plurality of plates disposed between the body and the detector devices to reduce the incidence, on detector devices being irradiated, of radiation transmitted from said source along indirect paths, wherein said source and said plates are arranged to move relative to said detector devices, the arrangement being such that said plates present substantially the same exit aperture to each detector device despite the relative movement.

4,101,769

METHOD FOR DIRECT MEASUREMENT OF BETA-RAY ABSORBED DOSE RATE AND AN INSTRUMENT THEREFOR

Kazuyoshi Bingo, and Katsuo Kawai, both of Tokai, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,082
Claims priority, application Japan, Oct. 6, 1975, 50-120531
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—361 R **4 Claims**

1. A method of measuring the β-ray absorbed dose rate

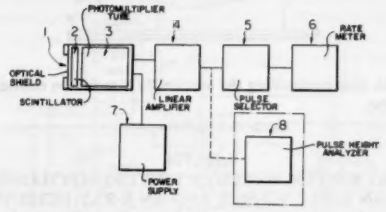
corresponding to the epidermal thickness of tissue independently of β-ray energy by a β-ray detector including a thin scintillator, a photomultiplier, a preamplifier and an amplifier to obtain a desirable shape of pulse height distribution, said method comprising the steps of:

preparing said thin scintillator, the thickness of said scintillator being less than the range of high energy β-rays such as ^{32}P and ^{90}Y β-rays;

passing high energy particles from said β-rays through said scintillator;

releasing only part of the energy of said particles in said scintillator;

converting said energy into electric pulses by said β-ray detector, the height of said pulses being smaller than that of the pulses caused by said high energy particles the energy of which is fully released in said scintillator, and



confirming that the absorbed dose rate can satisfy the following equation:

$$\overline{Dt}\,(E\ \max) = Kt.\ \overline{Ct}\,(E\ \max),$$

where Dt (E max), Ct (E max) and Kt are the absorbed dose rate per fluence rate for β-rays the maximum energy of which is E max, the counting rate per fluence rate, and the conversion constant of counting rate - dose rate, respectively, and the suffix "*t*" represents the epidermal thickness of tissue and Ct (E max) obtained in accordance with the steps above, by counting said pulses selected with a single channel analyzer, the lower discrimination level and window width of which are defined by the epidermal thickness of tissue.

4,101,770

CAMERA ARRANGEMENT FOR SCINTIGRAPHY

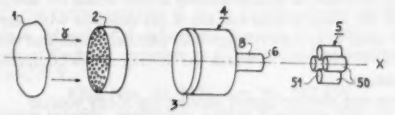
Henri Rougeot, and Guy Roziere, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 12, 1977, Ser. No. 796,342

Claims priority, application France, May 18, 1976, 76 14957

Int. Cl.² G01T *1/20*

U.S. Cl. 250—363 S **2 Claims**



1. A camera assembly for use in scintigraphy in which the image of the subject, which is subjected to the circulation of a fluid containing an unstable isotope formed by the radiation emitted by the points of the subject under the effect of said isotope, is observed by elements in which each point of the image generates a signal, and in which a system ensures the treatment of the signals generated by each of said points in such a way as, on the one hand, to detect the energy of the radiation emitted by the corresponding point of the subject when it is struck by said isotope and, on the other hand, to define its position, wherein said treatment system is in two parts consisting of two delay devices imparting unequal delays to said signals, the first of said devices, which has the shorter delay, comprising means for roughly calculating the position of the point, means for correcting the inequalities of gain between the different points of the image and means for selecting the signals which have undergone said correction so as to exclude those signals which are not comprised between two limits, namely an upper limit and a lower limit, situated on either side of the energy level of the radiation normally emitted by the points of the subject reached by said flow, the second of the said devices comprising a calculator which receives, on the one hand, the said signals with a delay equal to that imparted to said signals by the first device and, on the other hand, the signals treated in said first device and which, during a second treatment and in a time appreciably greater than the preceding delay, computes the precise position of the point from which these signals have emanated, said treatment system finally comprising means for extracting the signals after treatment.

4,101,771

ION ELECTRON CONVERTER

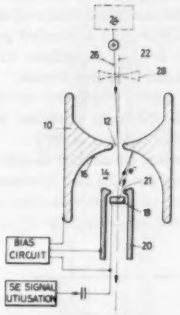
Wolfgang O. Hofer, Mühlgasse 16, Garching, and Jürgen Kirschner, Monheimsallee 62, Aachen, both of Fed. Rep. of Germany

Filed Jul. 30, 1976, Ser. No. 710,302

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1975, 2534796

Int. Cl.² H01J *3/14*

U.S. Cl. 250—397 **13 Claims**



1. An ion electron converter comprising an electrode (10) having an aperture (12) adapted to be traversed by ions from an ion source (24), comprising a secondary electron emissive surface (16) on a first side which, in operation, is averted from said ion source and formed as a smoothly curved concave surface and defining a converter chamber (14);

means for reflecting ions, that have passed through said aperture (12), onto said secondary electron emissive surface (16) including

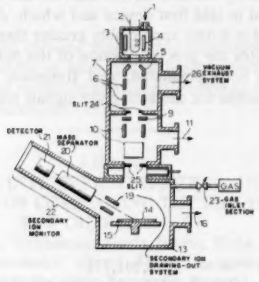
electrode means (20) positioned within the converter chamber (14), and a bias voltage source means biassing the electrode means with respect to the secondary electron emissive surface to reflect ions unto said secondary electron emissive surface;

and a secondary electron detector (18) for detecting secondary electrons ejected from the secondary electron emissive surface (16) by said ions, located within the converter chamber and positioned with respect to the secondary electron emissive surface (16) to be essentially surrounded by at least a portion thereof.

4,101,772
ION-BEAM ETCHING METHOD AND AN APPARATUS THEREFOR

Fumiya Konishi, Toyonaka; Kenji Kusao, Osaka, and Yoshiaki Yoshioka, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 17, 1977, Ser. No. 759,870
Claims priority, application Japan, Jan. 19, 1976, 51-5242
Int. Cl.[2] A61K *27/02*
U.S. Cl. 250—399 6 Claims



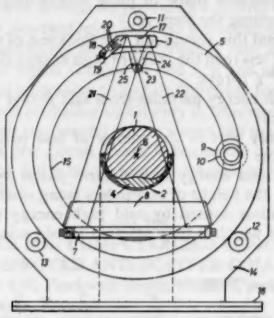
1. An ion-beam etching apparatus comprising:
an ion source for producing a beam of ions;
a beam focusing means aligned with the beam of ions from said ion source for focusing the beam from said ion source;
a beam source chamber enclosing said ion source and said beam focusing means for prevention of the introduction of unwanted gases into the path of the beam of ions;
a specimen chamber aligned with said beam focusing means and connected with said beam source chamber for prevention of the introduction of unwanted gases into the ion beam path and for holding a specimen to be etched by the beam from said beam focusing means;
a vacuum exhaust means connected to said beam source chamber and said specimen chamber for removing gas from the path of the beam of ions;
a gas introducing means connected to said specimen chamber for introducing gas into said specimen chamber; and
an additional vacuum exhaust means connected to said beam source chamber for removing gas from the path of the beam of ions.

4,101,773
RADIOGRAPHY

Christopher Archibald Gordon LeMay, Osterley, and Robert Paul Randall, Uxbridge, both of England, assignors to EMI Limited, Hayes, England

Filed Oct. 26, 1976, Ser. No. 735,012
Claims priority, application United Kingdom, Nov. 4, 1975, 45726/75
Int. Cl.[2] H05G *1/26*
U.S. Cl. 250—401 7 Claims

1. Radiographic apparatus including an x-ray tube arrangement having an electron emissive cathode, means for supplying energy to said cathode, during operation of said tube, to cause said cathode to emit electrons, means constraining said electrons to form a beam, an x-ray emissive target disposed to intercept said beam and adapted to emit x-radiation in response to the impingement thereon of said beam, support means supporting said tube, in spaced relationship with respect to a patient, so that said radiation travels towards the patient, detector means, disposed in the space between said tube and the patient, to detect radiation emitted by said tube, said detector means producing an output signal indicative of the amount of said radiation detected thereby, and regulating means utilising said output signal to regulate the supply of energy to said

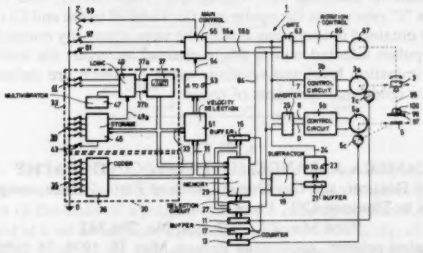


cathode, thus controlling the amount of x-radiation emitted by said tube.

4,101,774
X-RAY SYSTEM HAVING A DRIVING MECHANISM FOR AN X-RAY SOURCE AND AN X-RAY DETECTOR

Johannes Mattheus Elzinga, and Albertus Derk Sondern, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,525
Claims priority, application Netherlands, Feb. 6, 1976, 7601219
Int. Cl.[2] H05G *1/00*
U.S. Cl. 250—402 9 Claims



1. An X-ray system for making a shadow image of a layer of an object, which X-ray system comprises an X-ray source and an X-ray detector, as well as driving means which are designed to move the X-ray source and the X-ray detector with respect to each other in at least substantially parallel planes and with a constant velocity ratio in which the driving means comprise, in combination:
at least one electric motor driving the X-ray source;
at least one electric motor driving the X-ray detector, each electric motor being connected to an electronic control circuit to control the number of revolutions of said motor, an electric coupling existing between the electric motors; wherein the electric coupling comprises:
signal generators which are connected to the electric motor and/or to the X-ray radiator and detector driven by electric motors so as to obtain signals which are a measure of the instantaneous position of the X-ray source and detector;
at least one comparison circuit which is connected to the signal generators and functions to derive from the signals generated by the signal generators a correction signal for a control circuit of one of the said electric motors,

whereby the movements of the X-ray source and detector are coordinated with each other; and

a controllable inverter circuit connected between the comparison circuit and the control circuit and selectably functioning in a first or in a second operating condition, as the need may be, a correction signal from the comparison circuit being inverted in the first operating condition and being not inverted in the second operating condition.

4,101,775

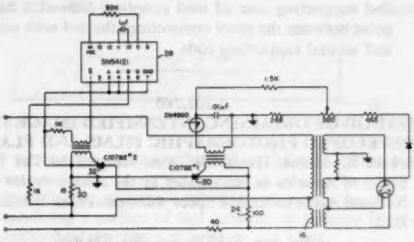
X-RAY TUBE CURRENT STABILIZING CIRCUIT

Frieder Hans Ensslin, Rochester, and Christopher Stevens Hazen, Fairport, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,558

Int. Cl.[2] H05G *1/34*

U.S. Cl. 250—409 **1 Claim**



1. For use with a rectifying X-ray tube, a power supply providing stabilized tube current by controlling the current through a filament comprised of:

a high voltage source for providing tube voltage;

a resistor in series with said high voltage source and said tube for producing a current signal voltage corresponding to the tube current;

trigger means for providing a first trigger signal when the current signal voltage exceeds a predetermined value;

a current reducing circuit switchably connected to said filament;

first switching means for connecting said current reducing circuit to the filament upon receipt of said first trigger signal until the end of the then occurring half cycle,

timer means for providing a delayed second trigger signal delayed one half cycle after the trigger signal, and

second switching means for connecting said current reducing circuit to the filament upon the receipt to the second trigger signal until the end of the then occurring half cycle.

4,101,776

IMAGE INTENSIFIER T. V. FLUOROSCOPY SYSTEM

Brian A. Mansfield, London, and Royston K. Watkins, Surrey, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,536

Claims priority, application United Kingdom, Nov. 25, 1975, 48361/75

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—416 TV **9 Claims**

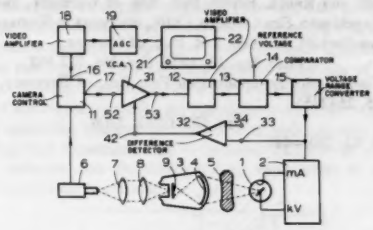
1. An image intensifier TV system comprising:

an X-ray source for directing X-rays through a body;

television pickup means including an image intensifier which receives X-rays which pass through said body and which produces an image therefrom, and camera means which provide a video signal from said image;

display means which produce a display from said video signal and which include an automatic gain control function;

negative feedback means having a closed loop which adjust target anode voltage and current applied to said X-ray source in response to the level of said video signal; and



automatic control means which increases a loop gain of the closed loop if said target anode voltage exceeds a predetermined voltage.

4,101,777

FLUID PURIFICATION DEVICE AND ULTRAVIOLET LAMP THEREFOR

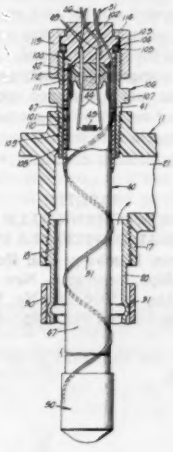
William P. Reid, 3200 E. 29th St., Long Beach, Calif. 90806

Continuation-in-part of Ser. No. 490,238, Jul. 22, 1974, Pat. No. 3,923,663. This application Sep. 8, 1975, Ser. No. 611,080

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—436 **10 Claims**



1. An ultraviolet lamp for immersion in the fluid of a fluid purifying device, and the like, comprising: an elongate transparent envelope having sealed opposite ends, each mounting an ignition element located within said envelope; a continuous solid thin film of material having a non-stick characteristic with respect to a fluid being treated by the device, said film surrounding said envelope and being fixed to and in intimate contact with the outer surface of said envelope; base means at one end of said envelope including a base member hermetically sealing the adjacent end of said film with respect to said envelope; and a cap member for the opposite end of said envelope hermetically sealing the adjacent end of said film with respect to said envelope.

4,101,778

ROD-SHAPED SPECIMEN HOLDER FOR AN OPTICAL CORPUSCULAR-BEAM APPARATUS

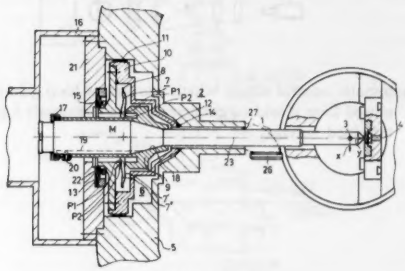
Moriz von Rauch, Berlin, Fed. Rep. of Germany, and Lee H. Veneklasen, San Leandro, Calif., assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,562

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2542351

Int. Cl.[2] G21K *5/06*

U.S. Cl. 250—441 2 Claims



1. In an optical corpuscular-beam apparatus including a rod-shaped specimen holder passing through a wall of the apparatus, said holder being secured in the apparatus wall by a first bearing and engaging at one end an adjustable counter-bearing in the interior of the apparatus, which apparatus interior is under a vacuum during operation of the apparatus; the improvement comprising:

an outer housing, mounted on said apparatus wall and disposed about the other end of said specimen holder, which other end is located outside said apparatus interior, the interior of said outer housing being under vacuum during the operation of the apparatus; and

said first bearing comprising a diaphragm disposed circumferentially about said rod-shaped specimen holder, said diaphragm being mounted in a second housing mounted within and rotatable with respect to said apparatus wall.

4,101,779

APPARATUS FOR MECHANICALLY SUPPORTING A MEDICAL DEVICE IN A PLANE

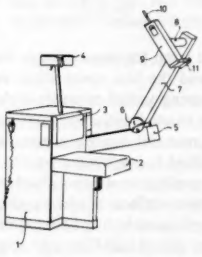
Walter Schmedemann, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,923

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536081

Int. Cl.[2] H01J *35/16*

U.S. Cl. 250—445 R 3 Claims



1. Apparatus for mechanically supporting a medical device at any position in a plane, comprising:

a first supporting rod for pivotably supporting a medical device at a first pivot point along said rod;

a first coupling rod pivotably connected to said first supporting rod at a second pivot point along said first supporting rod;

A second coupling rod parallel to said first coupling rod and pivotably connected to said first supporting rod at a third pivot point between said first and second pivot points;

a counterweight

a second supporting rod supporting said counterweight at a fourth point along said second supporting rod, said second supporting rod being parallel to said first supporting rod and pivotably connected to said first and second coupling rods at fifth and sixth pivot points respectively, said fifth pivot point being between said fourth and sixth points, said second, third, fifth and sixth pivot points defining a parallelogram; and

a pivot shaft perpendicular to the plane of the parallelogram and supporting one of said coupling rods at a balance point between the pivot connections thereof with said first and second supporting rods.

4,101,780

METHOD OF OBTAINING INTENSIFIED IMAGE FROM DEVELOPED PHOTOGRAPHIC FILMS AND PLATES

Barbara S. Askins, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 9, 1976, Ser. No. 694,406

Int. Cl.[2] G03C *5/16, 1/04, 5/32;* C09K *3/00*

U.S. Cl. 250—475 12 Claims

1. A method of obtaining intensified images from silver images on developed films or plates comprising the steps of:

(a) converting silver of the developed film or plate to a radioactive compound by contacting said film or plate with an aqueous alkaline solution of an organo-S^{35} compound selected from the group consisting of thiourea-S^{35} and substituted thiourea-S^{35} compounds;

(b) placing said film or plate treated in step (a) in direct contact with a receiver film whereby said receiver film is exposed by radiation from said radioactive compound; and

(c) developing and fixing the resulting intensified receiver film.

4,101,781

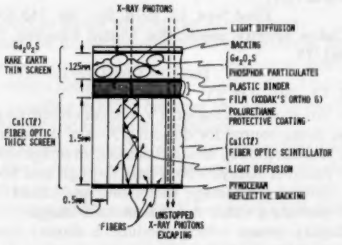
STABLE FIBER OPTIC SCINTILLATIVE X-RAY SCREEN AND METHOD OF PRODUCTION

Armand Paul Neukermans, Palo Alto, and William Paul Kruger, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 27, 1977, Ser. No. 806,966

Int. Cl.[2] G01J *1/58*

U.S. Cl. 250—483 16 Claims



1. A method of producing a fiber-optic scintillator that is

stable under ambient conditions, the method comprising the steps of:

evaporating a first material;

evaporating a second material; and

vacuum depositing the evaporated materials onto a selected backing material to produce a scintillator having uniformly shaped optical fibers that are stable under ambient conditions.

4,101,782

PROCESS FOR MAKING PATTERNS IN RESIST AND FOR MAKING ION ABSORPTION MASKS USEFUL THEREWITH

Robert L. Seliger, Agoura, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 626,425, Oct. 28, 1975, abandoned. This application May 5, 1977, Ser. No. 794,288

Int. Cl.[2] B05D *3/06*

U.S. Cl. 250—492 B **4 Claims**

1. A process for making a charged particle absorption mask including:

(a) providing an aluminum substrate,

(b) anodizing a surface of said substrate to thereby form an anodized Al_2O_3 coating thereon,

(c) depositing a gold mask on one surface of said anodized coating, and

(d) selectively removing a region of said aluminum substrate underlying said anodized coating and said gold mask to thereby expose said anodized coating and permit same to pass accelerated particles therethrough.

4,101,783

OZONE GENERATOR

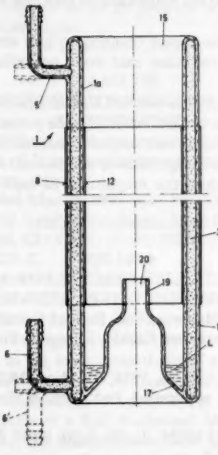
Felix Jakob Hutter, Altstätten, Switzerland, assignor to Hutter Apparatebau AG, Altstätten, Switzerland

Filed Jan. 12, 1977, Ser. No. 758,766

Claims priority, application Switzerland, Jan. 20, 1976, 621/76; Jun. 14, 1976, 7550/76; Fed. Rep. of Germany, Dec. 10, 1976, 2656176

Int. Cl.[2] C01B *13/11*

U.S. Cl. 250—540 **21 Claims**



1. Apparatus for enriching an oxygen-containing gas with ozone, comprising a one-piece twin-walled tube consisting of dielectric material and having an inner side and an outer side, said tube defining an annular chamber and further having an inlet for admission of oxygen-containing gas into and an outlet for evacuation of enriched gas from said chamber; a first electrode adjacent to said inner side; a second electrode adjacent to said outer side opposite said first electrode, at least one of said electrodes leaving exposed at least one substantially annular portion of the respective side; and means for confining a supply of liquid insulating medium in contact with said exposed portion of said last mentioned side to prevent the flow of creep currents between said electrodes during application of high voltage across said electrodes.

4,101,784

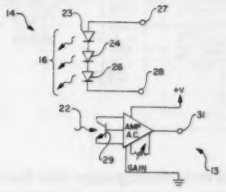
COLOR MARK DETECTOR

Paul Franklyn Key, San Martin, and Anthony Ross Lazzara, Portola Valley, both of Calif., assignors to Scientific Technology Incorporated, Mountain View, Calif.

Division of Ser. No. 712,607, Aug. 9, 1976, Pat. No. 4,047,023. This application Jun. 24, 1977, Ser. No. 809,542

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—555 **3 Claims**



1. A method for detecting a mark on a surface having a contrasting background comprising the steps of projecting a pulsing multiwavelength component light beam toward the surface, sensing the intensity of light pulses reflected from the surface, producing sensing signals corresponding to the intensity of said light pulses, producing integrated signals from said sensing signals, producing time delayed reflected light pulse intensity signals from the integrated signals, comparing the sensed and time delayed signals, producing a dark mark output for sensed signals corresponding to lower intensity than those compared time delayed signals, and producing a light mark output for sensed signals corresponding to higher intensity than those compared time delayed signals.

4,101,785

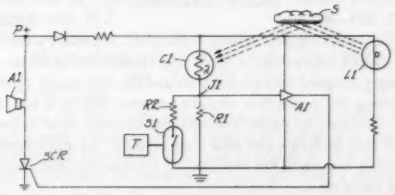
SMOKE DETECTOR WITH SWITCH MEANS FOR INCREASING THE SENSITIVITY

William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed May 19, 1977, Ser. No. 798,578

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—574 **12 Claims**



1. A smoke detector comprising smoke responsive means and associated circuitry producing a signal output which is a function of smoke concentration and level detector means

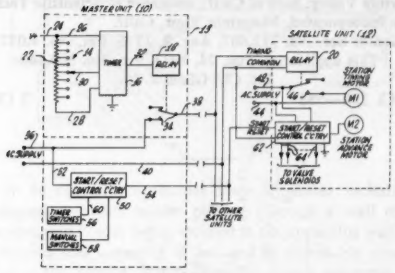
responsive to said signal of a predetermined level to actuate alarm energizing means, and switch means so connected into said circuit that when the switch isin a first condition, the alarm is actuated at a lower smoke concentration than when the switch is in a second condition.

4,101,786

MASTER-SATELLITE IRRIGATION CONTROL SYSTEM WITH REMOTE PROPORTIONAL TIMING

Richard L. Ruggles, Mount Baldy, and Vinod Panday, Covina, both of Calif., assignors to Clemar Manufacturing Corporation, Glendora, Calif.

Filed Jun. 14, 1976, Ser. No. 695,908
Int. Cl.[2] H02J *1/06*
U.S. Cl. 307—38 **16 Claims**



1. Remote proportional timing apparatus for controlling an irrigation system having master and satellite control units, said apparatus comprising:

timing signal source means located at a master control unit, for supplying timing signals which will in part determine the durations of energization of a plurality of valves;

timing signal utilization means at a satellite control unit, connected to operate in response to the timing signals transmitted from said timing signal source means and including means for controlling the durations of energization of the plurality of valves; and

timing signal conductor means connecting said timing signal source means to said timing signal utilization means; and

means for controlling said timing signal source means, thereby to vary the rate of operation of said timing signal utilization means, and to vary the durations of energization of the valves all to the same proportionate degree.

4,101,787

ELECTRICAL POWER SUPPLY

Ande R. Vail, Boise, Id., assignor to Meb, Inc. and Au-Tom-A-Ton Research Company, both of Boise, Id.

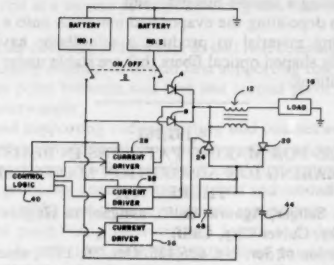
Filed Sep. 15, 1976, Ser. No. 723,464
Int. Cl.[2] H02J *7/00*
U.S. Cl. 307—81 **3 Claims**

1. In a power supply having a plurality of batteries for supplying direct current to a load, the respective batteries and load being coupled by switching means for alternately opening and closing the respective circuits between the load and each of the batteries to cause intermittent current flow between each of said batteries and said load serially, the improvement comprising a method for maximizing system efficiency including the steps of:

(a) determining the load current for operation of said load,

(b) selecting and providing batteries having an ampere/hour rating of at least ten times the value of the load current, and

(c) adjusting the switching means to alternately open and close the respective circuits at time intervals such that the



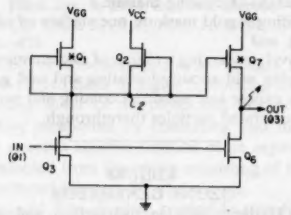
closed circuit time duration for each of the circuits is between 2–6 seconds.

4,101,788

MOS BUFFER CIRCUIT

Lamar T. Baker, Manhattan Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,122
Int. Cl.[2] H03K *19/08, 19/34, 19/36, 19/40*
U.S. Cl. 307—205 **19 Claims**



1. An MOS control circuit for controlling an output signal, said control circuit being coupled to first and second sources of potential comprising:

(a) a node;

(b) first circuit means for inverting an input signal and for producing an output potential at said node having a magnitude equal to the magnitude of said first source of potential;

(c) second circuit means coupled to said second source of potential for reducing said node potential by a desired amount;

(d) third circuit means coupled to said first cource of potential and driven by said reduced node potential for producing said control circuit output signal having a magnitude greater than the magnitude of said second source of potential but less than the magnitude of said first source of potential.

4,101,789

SIGNAL MULTIPLIER CIRCUIT FOR A VEHICLE ANTI-SKID WHEEL SENSOR

Gerhard Ruhnau, Hanover, Fed. Rep. of Germany, assignor to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 16, 1976, Ser. No. 714,294
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2549953
Int. Cl.[2] H03K *21/00, 5/00;* **B60T** *8/00*
U.S. Cl. 307—220 R **10 Claims**

1. A frequency multiplier circuit having an output signal

whose alternation frequency is a multiple of the frequency of the sinusoidal input signal generated in accordance with the angular velocity of a rotating member, comprising:

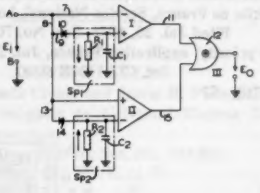
(a) an input terminal to which said sinusoidal input signal is connected;

(b) first and second comparators each having an output and a pair of inputs, one input of the first comparator and a different input of the second comparator being connected to said input terminal;

(c) first and second signal modifying circuit means connected to the other inputs of the respective comparators for providing a first and second modifying signal thereat with which said sinusoidal input signal is compared, each said first and second circuit means comprising:

(i) a capacitor connected between said input terminal and ground so as to be charged by said sinusoidal input signal; and

(ii) a resistor via which said capacitor of the same one of



said circuit means is discharged in accordance with a certain chosen r-c time constant;

(d) first and second diodes, each disposed between said input terminal and the capacitor of a respective one of said first and second circuit means, whereby said one capacitor is charged to the peak value of the sinusoidal input signal during positive half-cycles and the other capacitor is charged to the peak value of the sinusoidal input signal during negative half-cycles thereof;

(e) said first and second comparators providing first and second difference signals at the respective outputs thereof in the absence of correspondence between the sinusoidal input signal and the modifying signal, said first and second difference signals having a 180° phase displacement therebetween; and

(f) logic means connected to the output of said first and second comparators for combining said first and second difference signals so as to provide a first multiple frequency output signal.

4,101,790

SHIFT REGISTER WITH REDUCED NUMBER OF COMPONENTS

Heichachiro Ebihara, Tokorozawa, and Takashi Yamada, Sayama, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 9, 1977, Ser. No. 776,018

Claims priority, application Japan, Mar. 10, 1976, 51-25042

Int. Cl.[2] G11C *19/28*; H03K *17/60*

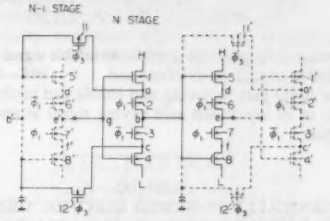
U.S. Cl. 307—221 C **5 Claims**

1. A shift register comprising:

a master section in which the drain electrode of a first P-channel MOS transistor having a source electrode connected to the high potential side of a power source is connected to the source electrode of a second P-channel MOS transistor at a first node, the drain electrode of said second P-channel MOS transistor is connected to the drain electrode of a first N-channel MOS transistor at a second node, the source electrode of said first N-channel MOS transistor is connected to the drain electrode of a second N-channel MOS transistor at a third node, and the source electrode of said second N-channel MOS transistor is connected to the low potential side of the power source; and

a slave section in which the drain electrode of a third P-channel MOS transistor having a source electrode connected to the high potential side of the power source is connected to the source electrode of a fourth P-channel MOS transistor at a fourth node, the drain electrode of said fourth P-channel MOS transistor is connected to the drain electrode of a third N-channel MOS transistor at a fifth node, the source electrode of said third N-channel MOS transistor is connected to the drain electrode of a fourth N-channel MOS transistor at a sixth node, and the source electrode of said fourth N-channel MOS transistor is connected to the low potential side of the power source;

wherein the respective gate electrodes of said first P-channel MOS transistor and said second N-channel MOS transistor are connected to each other at a seventh node, first and second clock pulses are applied to the respective gate



electrodes of said second P-channel and first N-channel MOS transistors, the respective gate electrodes of said third P-channel MOS transistor and fourth N-channel MOS transistor are tied together and connected to said second node of the master section, and the second and first clock pulses are applied to respective gate electrodes of said fourth P-channel MOS transistor and third N-channel MOS transistor;

whereby the master section and slave section form a 1-bit stage which is thereafter connected to a plurality of similarly constructed cascades;

said first and third nodes of the master section, with the exception of the initial stage, being connected to a second node of the master section of the preceding stage through a fifth P-channel MOS transistor and fifth N-channel MOS transistor, respectively, with third and fourth clock pulses being applied to respective fifth P-channel MOS transistor and fifth N-channel MOS transistor thereby to produce an output at said fifth node.

4,101,791

DUAL CHANNEL WIDE-BAND FREQUENCY MODULATED KEYABLE CONTROL CIRCUIT AND KEYING CIRCUIT THEREFOR

Carl E. Atkins, Montclair, and Francis A. McGuirk, Jr., Chatham, both of N.J., assignors to Wagner Electric Corporation, Parsippany, N.J.

Division of Ser. No. 660,116, Feb. 23, 1976, Pat. No. 4,045,778. This application Oct. 28, 1976, Ser. No. 736,374

Int. Cl.[2] H03K *17/00*

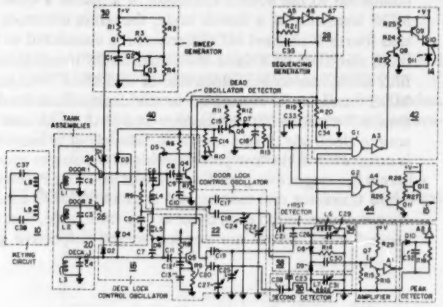
U.S. Cl. 307—308 **3 Claims**

1. In an electronically keyable control system of the type in which swept *rf* energy from a swept *rf* oscillator is connected to at least one sensing location and in which at least one keying signal is generated in response to a predetermined condition of physical proximity of a keying circuit to said sensing location, said keying circuit being resonant at at least one frequency within the sweep range of said swept *rf* oscillator, the improvement of a dead oscillator detector comprising:

(a) means for detecting a sample of the swept *rf* energy at at least one of said at least one sensing location;

(b) means for generating a constant enable signal when said sample of swept *rf* energy contains a predetermined modulation;

(c) said means for generating a constant enable signal being



operative to generate a constant inhibit signal during the absence of said modulation; and

(d) an AND gate receiving said enable and inhibit signals at one of its inputs and said keying signal at another of its inputs.

4,101,792

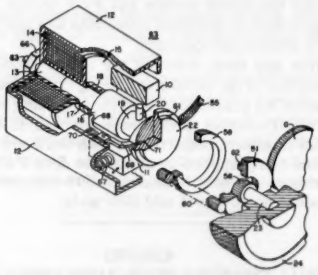
MECHANICALLY-POWERED ELECTRIC GENERATOR FOR INSTANT-PHOTOGRAPHIC CAMERA AND OTHER APPARATUS

William E. Shoupp, Pittsburgh, and Walter V. Bratkowski, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 380,179, Jul. 17, 1973, Pat. No. 3,840,297. This application Aug. 29, 1974, Ser. No. 501,560

Int. Cl.[2] H02K *35/00*

U.S. Cl. 310—15 **12 Claims**



1. A mechanically-powered generator for producing a pulse of electrical energy, said generator being of the recockable type and comprising the combination of;

a permanent magnet and a pole piece that are movable relative to one another and constitute parts of a magnetic circuit,

an armature that is movable toward and away from said pole piece and also constitutes part of said magnetic circuit, said armature being magnetically attracted to said pole piece and in magnetically captured relationship therewith when the electric generator is cocked and ready for use,

a winding of insulated wire disposed is inductive relationship with said magnetic circuit and oriented to generate a voltage pulse in response to a change in the flux density of the magnetic circuit produced by the movement of said armature relative to said pole piece,

means for tripping the cocked electric generator comprising means for displacing said permanent magnet and pole piece relative to one another a sufficient distance to effect a concomitant decrease in the field strength of the magnetic circuit, and

means for controllably storing mechanical energy and, in response to the actuation and operation of said tripping means, converting the stored mechanical energy into a force that acts on said armature and is so oriented and of such magnitude that the weakened magnetic attractive force on the armature is overcome and the position of said armature relative to the pole piece is thereby rapidly shifted and causes a voltage pulse to be generated by the wire winding.

4,101,793

ROTATING MACHINE USING A COOLING FLUID SUPPLIED BY A ROTATING SEAL

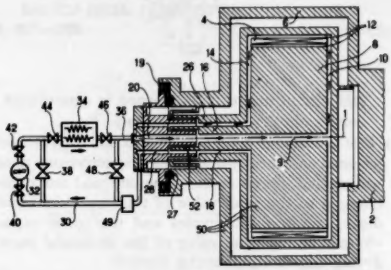
Michel Berthet, Gif sur Yvette; Roger Gillet, Belfort; Yves Laumond, Longjumeau; Christian Lehuen, Belfort, and André Marquet, Paris, all of France, assignors to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A. and Electricite de France, Service National, both of Paris, France

Filed Jul. 20, 1976, Ser. No. 707,138

Claims priority, application France, Jul. 22, 1975, 75 22865

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—52 **12 Claims**



1. An electric machine with a superconductive rotor provided with a cooling circuit having rotating seals, comprising:

a rotor mounted for rotation about its axis and having a peripheral zone of which heat is generated;

an internal cooling circuit in said rotor enabling the circulation of a cooling fluid subjected to centrifugal force resulting from the rotating of this rotor, said circuit comprising a rotary supply pipe within the axis of the rotor, first pipes extending radially outward from the rotary supply pipe and allowing the fluid to move away from said axis to reach the rotor peripheral zone, second pipes extending longitudinally within said rotor peripheral zone having a first end connected to respective first pipes and allowing the fluid coming from this descending pipe to circulate in the peripheral zone, collecting the heat generated in this zone; outlet means for the cooling fluid which has crossed through the second pipes;

a stationary external cooling circuit outside of said rotor comprising a stationary supply pipe, a rotating supply seal connecting said stationary supply pipe to said rotary supply pipe, and a stationary outlet pipe collecting the cooling fluid leaving the rotor;

a cooling device connected in series between the stationary supply and outlet pipes for cooling the cooling fluid;

means for circulating the cooling fluid through said cooling device, the stationary and rotary supply pipes, the first pipes, the second pipes, said outlet means and said stationary pipe;

said cooling fluid outlet means comprising third pipes connected to the second end of respective second pipes and extending radially to allow the cooling fluid to return towards the axis of the rotor and a rotary outlet pipe

disposed along said axis and connected to the stationary outlet pipe by a rotary outlet seal coaxial with the supply seal, one of these two rotating seals forming an inner rotating seal limiting the communication between the supply and outlet pipes and the other of said rotating seals forming an outer rotating seal separating the space inside the cooling circuits from the space outside these circuits;

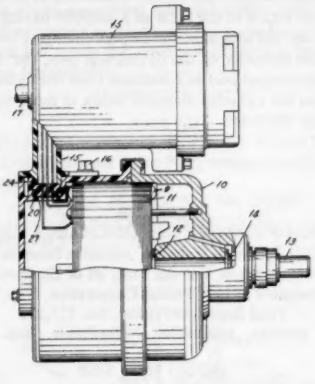
said rotating inner seal being of the "bayonet" type in which the two pipes connected by the seal comprise an outer pipe and an inner pipe, the outer pipe surrounding the inner pipe extending over an axial covering length forming a radial gap between the adjacent surfaces of these two pipes, the radial gap between these adjacent surfaces being greater than 0.6 mm at least when the rotor rotates at its highest speed, so as to enable the thermosiphon effect resulting from the rotating of the rotor and from the difference in temperature of the cooling fluid between the first pipes and the third pipes to make the cooling fluid circulate in a closed loop constituted by the inner circuit and by the leakage of the inner seal through said radial gap.

4,101,794

MOTOR SEALS

John E. Miller, Swartz Creek, and James R. Postema, Owosso, both of Mich., assignors to Universal Electric Company, Owosso, Mich.

Filed Dec. 3, 1976, Ser. No. 747,065
Int. Cl.² H02K *11/00*
U.S. Cl. 310—71 **3 Claims**



1. In a submersible motor or the like, the combination comprising

a first housing containing a motor field stator having a field winding,

a second plastic housing mounted on said first housing,

said field having unencased field winding wires,

said first housing having an open ended cylindrical cavity therein in the periphery thereof with the open end of said cavity extending outwardly of said housing,

said first housing having a opening in the base of said cavity of lesser diameter than said cavity,

a cylindrical body of compressible elastomeric material positioned in said cavity,

said body having an exterior configuration and dimensions which conform generally with the configuration and dimensions of the cavity so that said body can be readily inserted in said cavity without substantial compression,

said body having a plurality of generally axial passages therein,

said unencased wires from said field winding having a diameter such that they can be readily inserted through said passages when said body is radially uncompressed,

said second housing having a cylindrical tubular wall having a uniform thickness and extending axially into the open end of said cavity and has a radial end surface,

and mounting means for mounting said second housing on said first housing and drawing said housings toward one another to force said tubular wall axially against said body to compress said body when said second housing is in mounted position on said first housing thereby compressing said body radially outwardly into tight conformity with the periphery of the cavity and radially inwardly into tight conformity with the unencased wires from the motor,

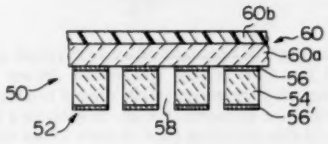
the portion of said body radially inwardly of said tubular wall being unrestrained axially.

4,101,795

ULTRASONIC PROBE

Akira Fukumoto; Masami Kawabuchi; Hiroshi Fukukita, and Jun-ichi Sato, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Japan

Filed Jun. 17, 1977, Ser. No. 807,600
Claims priority, application Japan, Oct. 25, 1976, 51 128472
Int. Cl.² H01L *41/10*
U.S. Cl. 310—336 **12 Claims**



1. An ultrasonic probe for ultrasonic inspection equipments, comprising:

a plurality of transducer elements, each being a rectangular plate of a piezoelectric material with front and back electrode films respectively coated on front and back surfaces thereof, said plate having a width-to-thickness ratio of not greater than 0.8, said transducer elements being arranged in a row at intervals with their longer sides opposite to each other so that said plate can make a width extensional vibration as a fundamental vibration mode; and

an acoustic impedance matching layer, consisting of a uniformly thick inner layer of a first material placed on said row of said transducer elements to intimately cover said front electrode films of all the transducer elements and a uniformly thick outer layer of a second material placed on said inner layer to intimately cover the outer surface of said inner layer,

the acoustic impedance of said first material being 2.5 to 9.5 times as large as the acoustic impedance of an object of ultrasonic inspection, the acoustic impedance of said second material being smaller than the acoustic impedance of said first material but is 1.6 to 2.7 times as large as the acoustic impedance of said object.

4,101,796

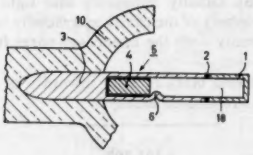
HIGH-PRESSURE DISCHARGE LAMP

Gijsbert Kuus, and Peter Andreas, Waltherus Tielemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,952
Claims priority, application Netherlands, Oct. 8, 1976, 7611135
Int. Cl.² H01J *61/24*
U.S. Cl. 313—178 **3 Claims**

1. A high-pressure discharge lamp having a discharge vessel comprising a gas filling, electrodes with electrode pins which are sealed into the wall of the discharge vessel and a hydrogen getter in a metal envelope, which is hydrogen permeable,

characterized in that the electrode pin of at least one electrode comprises a closed cavity extending in the longitudinal direction thereof in which cavity the hydrogen getter is present adjacent to the wall of the discharge vessel and at least mainly within the discharge vessel and that the electrode pin at its end



within the lamp vessel consists of a metal part of a metal selected from the group formed by tantalum, niobium, alloys of tantalum and niobium and alloys of at least 5 atom % of at least one of the said materials with at least one of the metals tungsten and molybdenum, which metal part bounds the cavity in the electrode pin.

4,101,797

OFF CENTER ELECTRODE SPARK PLUG

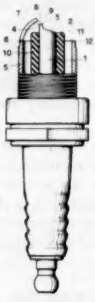
Iwao Yamamoto, No. 1-13, Shirasagi, 1-chome, Nakano-ku, and Morio Koga, both of Tokyo, Japan, assignors to said Iwao Yamamoto, by said Moriro Koga, Tokyo, Japan, a part interest

Filed Dec. 16, 1976, Ser. No. 751,530

Claims priority, application Japan, Dec. 18, 1975, 50-151402; Sep. 1, 1976, 51-104667

Int. Cl.² H01T *13/20*

U.S. Cl. 313—141 **2 Claims**



1. A spark plug in which an arcuate projection is provided at the end face of a central electrode said arcuate projection comprised of an off-center extension of said central electrode, an insulator separating said central electrode from a main body having an end surface, said insulator interposed directly between said electrode and said body with only said arcuate projection exposed to said main body, and an arcuate earthing electrode is fixed by a projection weld to the end surface of said main body to form and maintain a small gap between an outer arcuate portion of said extension and an underside angular portion of the nose of said earthing electrode.

4,101,798

ELECTRIC LAMP WITH A TORPEDO SHAPED CONDUCTOR TIP

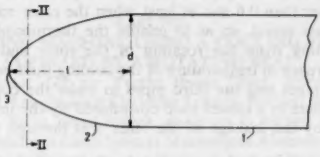
Victor Rosallie Netelteirs, and René Maria Vosters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,720

Claims priority, application Netherlands, Jun. 21, 1976, 7606691

Int. Cl.² H01K *1/40*

U.S. Cl. 313—315 **2 Claims**



1. An electric lamp having a glass lamp vessel with at least one pinch seal, in which at least one metal foil is incorporated as a current leadthrough conductor to one end of which is connected an internal current conductor towards an electrically conductive member situated inside the lamp vessel and the opposite end of which is connected to an external current conductor comprising a cylindrical rod extending for the greater part outside the pinch seal, said rod having, at its end situated within the pinch seal, a non-cylindrical shape, characterized in that the external current conductor at its end situated in the pinch seal is in the form of a torpedo having a blunt or non-blunt tip, the length of the torpedo-like part being at least equal to the diameter of the cylindrical part, the diameter of the torpedo-shaped part at a distance from the cylindrical part of 0.9 times the cylinder diameter being at most equal to half the cylinder diameter.

4,101,799

HIGH-PRESSURE GAS DISCHARGE LAMP

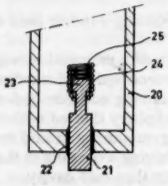
Piet Wiedijk; Johannes Hubertus Antonius Schmitz, and Antonius Henricus Maria Van der Stap, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1976, Ser. No. 721,288

Claims priority, application Netherlands, Sep. 11, 1975, 7510691

Int. Cl.² H01J *5/50*

U.S. Cl. 313—331 **7 Claims**



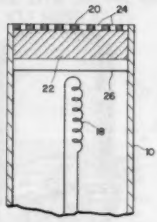
1. A high-pressure gas discharge lamp which comprises a discharge vessel having a wall which consists mainly of at least one of the compounds selected from the group consisting of aluminium oxide and yttrium oxide, said vessel containing an ionizable gas filling, means for maintaining a gas discharge which includes at least one electrode and a current supply conductor connected thereto, said conductor being disposed within said discharge vessel and consisting mainly of at least one boride selected from the group of titanium boride and zirconium boride.

4,101,800

CONTROLLED-POROSITY DISPENSER CATHODE

Richard E. Thomas, Riverdale, Md., and Titus Pankey, Jr., Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1977, Ser. No. 813,389
Int. Cl.[2] H01J 1/14, 19/06
U.S. Cl. 313—346 DC 8 Claims



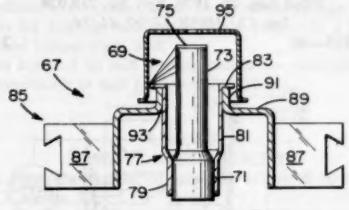
1. A thermionic, dispenser-type cathode having an emissive member comprising:
- a backing plug;
- a "nonporous" reservoir of active cathode material, comprising a quantity of at least one alkaline earth material, adjacent said backing plug; and
- a foil disposed on the free surface of said reservoir, said foil being formed from at least one refractory metal with a set of uniformly sized and spaced holes therein to permit the active electron-emitting material within said reservoir to migrate through said holes and to spread over the surface of said foil when the reservoir material is heated to the proper temperature.

4,101,801

SHIELDED CATHODE SUPPORT STRUCTURE

Floyd K. Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 28, 1977, Ser. No. 791,867
Int. Cl.[2] H01J 29/02, 29/82
U.S. Cl. 313—417 8 Claims



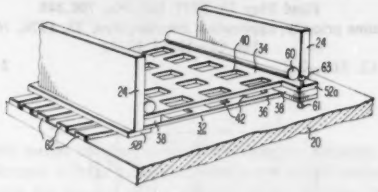
1. In a cathode ray tube having a control grid and an electron gun assembly with at least one insulator rod supporting a plurality of electrode elements, a shielded cathode support structure comprising:
- a cup-shaped control grid electrode affixed to said insulator rod;
- a cathode having an open end and a closed end with said closed end having a layer of electron emissive material thereon and located within said cup-shaped control grid electrode;
- an eyelet member having upper and lower portions, said upper portion having a flared end within said cup-shaped control grid electrode and said lower portion having a diameter suitable for attachment to said cathode; and
- a support member having a first section formed for attachment to said insulator rod and a second section in a plane substantially normal to said first section, said second section having a flared upstanding portion which surrounds a central aperture of a size to receive said eyelet member and provides a contacting surface for said flared portion of said eyelet member whereby said flared portion of said eyelet member and said cup-shaped control grid electrode serve to shield said insulator rod and electrode elements therein from cathode sublimation.

4,101,802

FLAT DISPLAY DEVICE WITH BEAM GUIDE

Zygmunt Marian Andrevski, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,300
Int. Cl.[2] H01J 29/02, 29/82
U.S. Cl. 313—422 11 Claims



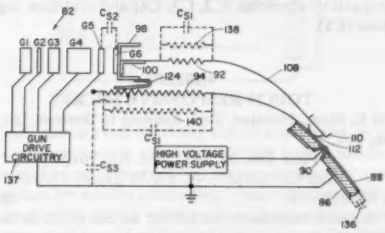
1. In a display device which includes an evacuated envelope having spaced, substantially parallel front and back walls, spaced parallel support walls between the front and back walls forming a plurality of channels extending across the front and back wall and an electron beam guide assembly in each of said channels, the improvement comprising:
- each of said electron beam guide assemblies including a pair of spaced, parallel grid plates each having a pair of spaced elongated substantially parallel edges, a separate spacer member between said grid plates at each of said edges, each of said grid plates being secured to said spacer members so that the plates are in a fixed relation to each other,
- each of said guide assemblies extending across a separate channel adjacent to the back wall, and
- means along the support walls for supporting said guide assemblies in a fixed spaced relation to said back wall.

4,101,803

ARC SUPPRESSION AND STATIC ELIMINATION SYSTEM FOR A TELEVISION CRT

Michael Walter Retsky, Chicago, and James W. Schwartz, Deerfield, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 1, 1977, Ser. No. 802,223
Int. Cl.[2] H01J 23/16, 29/96
U.S. Cl. 315—3 8 Claims



1. In a television cathode ray tube including an evacuated glass envelope having on an external surface of a funnel portion thereof an outer conductive coating and on an internal surface thereof an inner conductive coating for receiving a

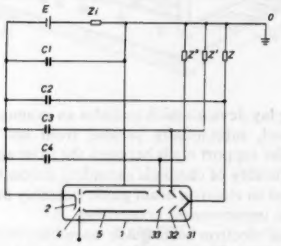
high voltage charge, said tube further comprising an electron gun located in a neck of the funnel, the tube being characterized by having an arc-suppression and static-elimination system comprising a discrete, non-distributed arc suppression resistor having a relatively low distributed capacitance and means for electrically and mechanically coupling said arc suppression resistor between said inner conductive coating and said electron gun, and in electrically parallel combination with said arc suppression resistor, an anti-static coating deposited on an inner surface of the neck around the beam egress from said gun.

4,101,804

TRAVELING WAVE TUBE WITH DEPRESSED COLLECTOR POWER SUPPLY

Leif Ronny Carlsson, Fjäras, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 23, 1977, Ser. No. 799,248
Claims priority, application Sweden, Jun. 23, 1976, 7607244
Int. Cl.[2] H01J *23/34*
U.S. Cl. 315—3.5 **3 Claims**



1. Power supply for a traveling wave tube with depressed collector which tube comprises a cathode, a grid, a collector and a wave structure arranged in the longitudinal direction of the tube, characterized in a voltage source (E, Zi) connected to the cathode (2) of the tube and to a reference potential (0), a first capacitive element (C1) connected to the voltage source for delivering a current to the wave structure (5) during the time interval the tube is conducting, a second capacitive element (C2) connected between the cathode of the tube and the collector (3) for delivering a current to the collector of the tube during the same time interval and an impedance (Z) connected between said capacitive elements (C1, C2) to prevent a current flow between the capacitive elements (C1, C2).

3. Traveling wave tube power supply according to claim 1, in the case that the traveling wave tube comprises a number of depressed collectors, characterized in that the same number of said second capacitive element (C2) as there are collectors are connected between the cathode (2) of the tube and each of the collectors (31, 32, 33) and that the same number of said impedances (Z) as there are collectors are connected between each of the capacitive elements (C2, C3, C4) and said first capacitive element (C1).

4,101,805

TOUCH-RESPONSIVE SOCKET

David E. Stone, Houston, Tex., assignor to Destron, Inc., Houston, Tex.

Filed Jan. 24, 1977, Ser. No. 761,569
Int. Cl.[2] H01J *7/44, 19/78, 29/96, 17/34*
U.S. Cl. 315—74 **30 Claims**

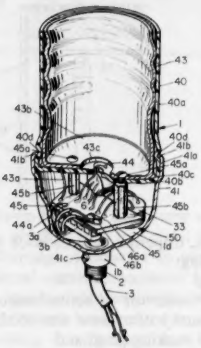
1. A touch-responsive socket for an electrical device comprising:

a first housing portion having an open first end and a substantially closed second end;

an electrically conductive socket member within said first housing portion and adapted to engage an electrical device through said first housing portion open first end to apply electrical power thereto;

a second housing portion formed of an electrically conductive material and having an open first end, engaging said first housing portion second end to form therewith a substantially enclosed chamber, and a second end adapted to mount said touch-sensitive socket on a base member;

a touch-responsive circuit within said chamber and electrically coupled to said socket member and to said second housing portion and, when coupled to a source of electrical power, responsive to touching of said second housing portion or an electrically conductive member electrically connected thereto to successively couple and de-couple said socket member to the source of electrical power, said touch-responsive circuit including timing means for inhibiting the responsiveness of said circuit for a preset time following termination of touching of said second housing portion and electrically conducting member; and



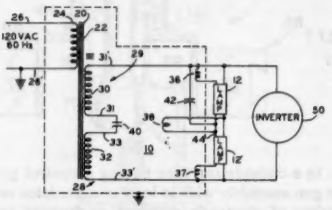
cable means for coupling said touch-sensitive circuit to a source of electrical power.

4,101,806

BALLAST EMI AND SHOCK HAZARD REDUCTION

Robert P. Alley, Manlius, N.Y., assignor to General Electric Company, Carmel, Ind.

Filed Aug. 26, 1976, Ser. No. 718,028
Int. Cl.[2] H05B *37/00, 41/14*
U.S. Cl. 315—86 **2 Claims**



1. In an electrical system for operating at least one gaseous discharge lamp from a line voltage AC source and upon failure of the AC source, from a DC energized, high frequency emergency circuit, the improvement comprising:

a ballast for operation from the AC source at high power factor, the ballast having means for reducing hazard associated with leakage current therein resulting from operation of the high frequency emergency circuit and for minimizing transference of EMI from the lamp side thereof to the AC source side thereof and to ground including an isolation transformer having at least a primary winding and a secondary winding; the secondary winding being divided into two portions; and a power capacitor

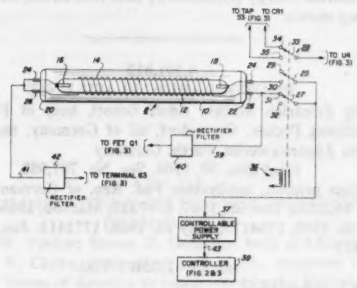
connected serially in circuit between the two portions of the secondary winding.

4,101,807

METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF LOW PRESSURE METAL OR METAL HALIDE LAMPS

Howard M. Hill, Glendale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 22, 1976, Ser. No. 669,079
Int. Cl.[2] H05B *41/36*
U.S. Cl. 315—116 **11 Claims**



1. Apparatus for forming a latent electrostatic charge pattern on a photoconductive insulating medium, said latent electrostatic charge pattern corresponding to the radiation pattern projected from an information bearing member comprising:

a charged photoconductive insulating member,

a low pressure metal vapor source for generating radiation of a predetermined spectral line, said information bearing member being interposed in the optical path between said metal vapor source and said charged photoconductive insulating member,

means for energizing said low pressure vapor source whereby radiation is emitted therefrom, said radiation exposing said information bearing member to selectively dissipate the charge on the surface of said photoconductive insulating member in accordance with the intensity of the radiation projected from said information bearing medium to form said latent electrostatic charge pattern,

means for heating said metal vapor source to a predetermined temperature, and

means coupled to said heating means for maintaining said temperature at said predetermined value.

4,101,808

LAMP CONTROL CIRCUIT

John R. Flint, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 30, 1975, Ser. No. 617,270
Int. Cl.[2] H05B *39/04*
U.S. Cl. 315—151 **10 Claims**

1. A lamp control circuit for maintaining the light output intensity of an incandescent lamp to be controlled constant comprising:

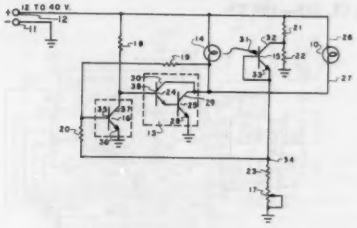
a pair of input terminals adapted for connection to an illuminating power source, one of said input terminals being coupled to one side of the incandescent lamp to be controlled;

switching means coupled to the other side of the controlled lamp and to the other input terminal so that when said switching means is closed the illuminating power from said power source is applied to the controlled lamp and when said switch is open the illuminating power to the controlled lamp is terminated;

illumination power sampling means comprising a second incandescent lamp coupled between said one input terminal and said switching means for sampling the illumination power and converting the sampled illumination power to light energy having an intensity related to the amount of illuminating power received by the controlled lamp;

a light sensitive detector operatively coupled to said second incandescent lamp for providing an intermediate control signal directly related to said second incandescent lamp light intensity;

reference voltage generating means for generating a reference voltage; and



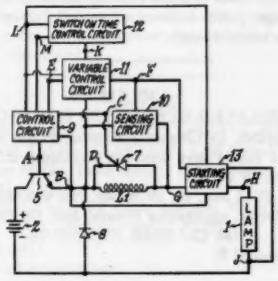
control means coupled to said light sensitive detector, said reference voltage generating means and to said switching means for causing said switching means to close for an interval dependent on the magnitude of the illumination power source when said intermediate control voltage is less than said reference voltage and for causing said switching means to open for an interval dependent on the response time of the second lamp when said intermediate control voltage is greater than said reference voltage to thereby render the light output intensity of the controlled incandescent lamp substantially constant.

4,101,809

DISCHARGE LAMP OPERATING CIRCUIT

Don Morais, Hendersonville, N.C., assignor to General Electric Company, N.Y.

Filed May 26, 1977, Ser. No. 800,983
Int. Cl.[2] H05B *37/02, 41/23*
U.S. Cl. 315—156 **13 Claims**



1. A lamp starting and operating circuit comprising, in combination, a direct current source, controlled switch means and inductance means connected in series across said power source, means for serially connecting a gaseous discharge lamp to said controlled switch means and said inductance means, means connected to said controlled switch means for limiting the peak current through said controlled switch means during the lamp starting interval, and control means coupled to said controlled switch means for repetitively and sequentially operating the same at predetermined intervals for applying DC

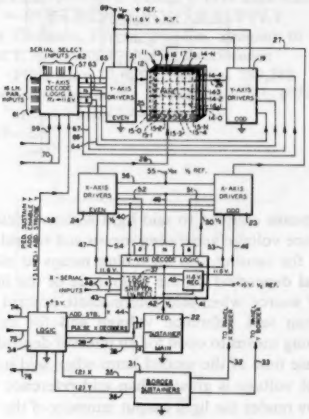
pulses to the gaseous discharge lamp for starting and operation thereof.

4,101,810

SYSTEM FOR AND METHOD OF OPERATING GAS DISCHARGE DISPLAY AND MEMORY

Jerry D. Schermerhorn, Swanton, and John W. V. Miller, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 19, 1976, Ser. No. 688,044
Int. Cl.[2] H05B *41/14*
U.S. Cl. 315—169 TV **39 Claims**



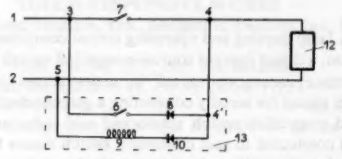
1. A method of manipulating the discharge condition of a gas discharge information storage panel device having a first array of dielectrically insulated electrodes transversely oriented with respect to a second array of dielectrically insulated electrodes, both of said arrays being proximate to gaseous discharge medium which comprises applying a periodically alternating pulse potential between electrodes of the first and second arrays through the gaseous discharge medium by applying a pulsating bulk sustainer voltage to the first array; selectively applying first voltage pulses referenced to the bulk sustainer voltage to electrodes of the first array; and selectively applying second voltage pulses referenced to a fixed voltage to electrodes of the second array.

4,101,811

DELAYED EXTINCTION CONTROL

Francois Dandrel, 12 Chemin Renaudin, 92260 Fontenay-aux-Roses, and Jean-Pierre Bouvier, Residence Bellevue, 91310 Nozay, both of France

Filed Jan. 16, 1976, Ser. No. 649,650
Claims priority, application France, Jan. 16, 1975, 75 01225
Int. Cl.[2] H05B *37/02, 39/06*
U.S. Cl. 315—200 R **10 Claims**



4. Apparatus for delaying the extinguishing of an alternating current energized source of illumination, the source of illumination including a primary control switch connected between a light emitter and current source, said delay apparatus comprising:

first circuit means connected in parallel with the light emitter, said first circuit means including electrically energized heating means and rectifier means connected in series between a first terminal of the current source and the load side of the primary control switch; and

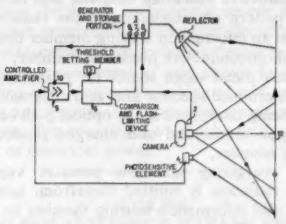
second circuit means, said second circuit means connected in parallel with the primary control switch and including a normally open temperature responsive secondary switch and second rectifier means, said second rectifier means being connected in opposite polarity with respect to said first rectifier means said second switch being responsive to thermal energy produced by said first circuit means heating means.

4,101,812

PHOTOGRAPHIC FLASH UNIT

Ludwig Friedrich Müller; Adolf Schott, both of Fürth, and Wolfgang Pecher, Gremsdorf, all of Germany, assignors to Metz Apparatewerke, Fürth, Germany

Filed Dec. 30, 1968, Ser. No. 787,988
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1968, 1622230; Dec. 28, 1967, 1597325; Mar. 30, 1968, 1772104; Apr. 18, 1968, 1764175; May 11, 1968, 1772411; Jun. 11, 1968, 1772617
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—241 P **8 Claims**



1. In an automatic photographic flash apparatus for use with a camera and including a flash unit, a flash-limiting device having a photoelectric element arranged to respond to the light reaching the camera from the subject being photographed and connected to terminate the light emission by the unit in response to the light received by the photoelectric element, and power energy supply means connected to deliver flash-triggering energy to the flash unit, the improvement comprising:

said apparatus including means electrically connecting said flash-limiting device with said flash unit for rendering said flash-limiting device operative only upon initiation of a flash-triggering signal to said flash unit,

said flash-limiting device including control voltage producing means electrically connected to said photoelectric element and also including a component for producing a voltage proportional to the time integral of the intensity of the light received by said photoelectric element from the instant of commencement of the triggering of a flash by said unit, said component being electrically connected so that its voltage forms a control voltage which, upon reaching a predetermined value, actuates said flash-limiting device to terminate the light flash being produced by said flash unit,

said flash unit including a flash-triggering transformer arranged to produce a flash-triggering pulse when a flash is to be produced and also including a secondary winding across which a voltage pulse is induced by such flash-trigger pulse,

and said flash limiting device further including a storage capacitor connected to provide operating power for said

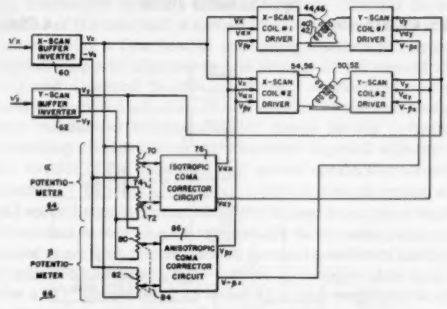
flash-limiting device and a rectifier connected between said secondary winding of said flash-triggering transformer and said storage capacitor for causing the voltage induced in said secondary winding to charge said capacitor to the voltage required for rendering said flash-limiting device operative,

and setting means for adjusting the responsitivity of said device in accordance with the sensitivity of the film used and the camera lens aperture being employed.

4,101,813
DOUBLE DEFLECTION SYSTEM FOR AN ELECTRON BEAM DEVICE

Norman W. Parker; Steven D. Golladay, both of Chicago, and Albert V. Crewe, Palos Park, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,416
Int. Cl.² H01J *29/56*
U.S. Cl. 315—370 **7 Claims**



1. In an electron beam device having means for generating a beam of electrons, a magnetic lens for focusing the beam to a point in any image plane, and scanning means for scanning the focused point in the image plane, the coordinates of the center of the scanned point in the image plane being $(x_i y_i)$, the beam normally being incident in the aperture plane of the lens at a location whose coordinates of the center of the beam are (x_o, y_o) and at a slope determined by the scanning means, the improvement in the instrument for simultaneously correcting isotropic coma and anisotropic coma aberrations, comprising:

deflection means positioned along the path of the beam prior to entry of the beam into the lens for displacing the intersection of the beam with the aperture plane so that the slope of intersection remains unchanged and so that the coordinates of the center of the beam at intersection (x_o and y_o) satisfy the relations

$$x_a = x_o + \alpha x_i + \beta y_i$$

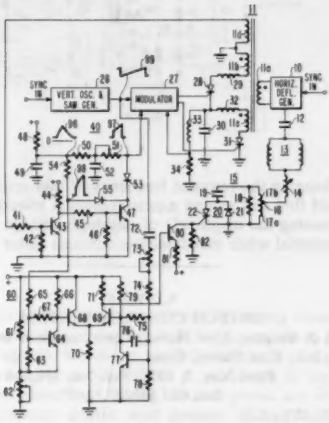
$$y_a = y_o + \alpha y_i - \beta x_i$$

where $\alpha = S_6/S_8$ and $\beta = S_7/S_8$ wherein S_6, S_7, and S_8, are abberration coefficients.

4,101,814
SIDE PINCUSHION DISTORTION CORRECTION CIRCUIT

Peter Eduard Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,561
Claims priority, application United Kingdom, Mar. 19, 1976, 11271/76
Int. Cl.² H01J *29/56*
U.S. Cl. 315—371 **6 Claims**



1. A side pincushion distortion correction circuit, comprising:

a horizontal deflection winding;

a horizontal deflection generator coupled to said deflection winding for supplying scanning current thereto;

scanning current modulating means including a controllable switch coupled to said deflection winding;

a vertical deflection generator;

means coupling said vertical generator to said modulating means for controlling said switch for providing modulation of said scanning current at said vertical rate; and

means coupling said horizontal generator to said modulating means for producing nonlinear horizontal rate signals for controlling said switch for providing a combined nonlinear horizontal rate and a vertical rate modulation of said scanning current in a manner for reducing said side pincushion distortion.

4,101,815
HORIZONTAL DEFLECTION CIRCUIT WITH HIGH VOLTAGE SELECTION CAPABILITY

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 13, 1977, Ser. No. 796,671
Int. Cl.² H01J *29/80*
U.S. Cl. 315—411 **20 Claims**

19. A circuit comprising:

a voltage regulator responsive to a source of unregulated voltage for providing an operating voltage at an output terminal;

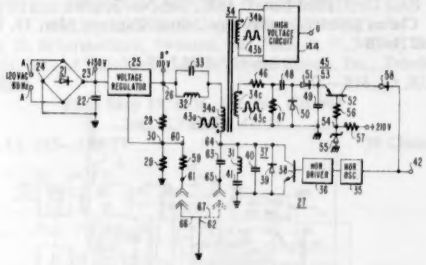
a deflection winding;

a deflection circuit coupled to said deflection winding for generating scanning current in said deflection winding for producing a raster, said deflection circuit including a capacitance coupled to said deflection winding for forming a resonant circuit therewith;

high voltage means coupled to said deflection circuit for providing a high voltage accelerating potential for beam current;

first means coupled to said voltage regulator for selectively changing the magnitude of said operating voltage; and

second means coupled to said resonant circuit for selectively



changing the resonant frequency of said resonant circuit, said first and second means combined selectively for decreasing the magnitude of said high voltage accelerating potential while maintaining a constant raster width.

4,101,816

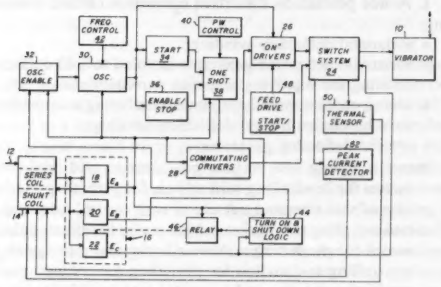
SWITCH CONTROL SYSTEM

Joseph J. Shepter, New Haven, Conn., assignor to Vibra-Metrics, Inc., East Haven, Conn.

Filed Nov. 3, 1976, Ser. No. 738,344

Int. Cl.[2] H02K *33/00*

U.S. Cl. 318—130 **24 Claims**



1. Apparatus for periodically connecting a source of direct current to an inductive load,

said direct current source including a capacitance connected between the opposite polarity output terminals thereof,

said apparatus comprising:

first solid-state switch means, said first switch means comprising a first silicon controlled rectifier connected between a first polarity terminal of the current source and a first side of the load;

second solid-state switch means, said second switch means comprising a second silicon controlled rectifier connected between the second polarity terminal of the current source and the second side of the load, said first and second silicon controlled rectifiers and the load defining a series circuit through which current can flow in a first direction when said rectifiers are in the conductive state;

a first diode connected between the first polarity terminal of the current source and the second side of the load; and

a second diode connected between the second polarity terminal of the current source and the first side of the load, said first and second diodes and the load defining a series circuit through which current may flow in a second direction when said silicon controlled rectifiers are in the non-conductive state, said diodes, rectifier, load and power supply capacitance forming a resonant circuit whereby energy may be delivered to the load when the silicon controlled rectifiers are in the conductive state and returned from the load when the silicon controlled rectifiers are in the non-conductive state.

oscillator means, said oscillator means generating timing control signals;

drive control means, said drive control means being responsive to the timing control signals generated by said oscillator means for producing gating signals;

means for coupling said drive control means produced gating signals to said first and second solid-state switch means to periodically render said first and second silicon controlled rectifiers conductive;

commutation control means, said commutation control means being responsive to the timing control signals generated by said oscillator means for periodically producing turn-off signals, said turn-off signals alternating with said gating signals;

means connected to said first and second solid-state switch means for interrupting current flow through said first and second silicon controlled rectifiers to thereby return said rectifiers to the non-conductive condition; and

means for coupling said turn-off signals from said commutation control means to said current flow interrupting means.

4,101,817

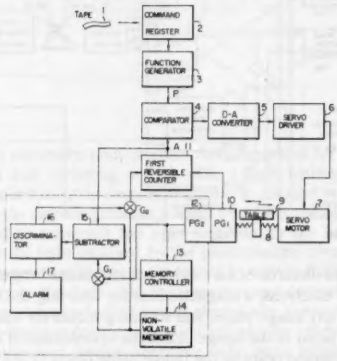
POSITION-CORRECTABLE NUMERICAL CONTROL SYSTEM

Yutaka Maeda, and Mitsuhiro Kawabe, both of Aichi, Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Jul. 6, 1976, Ser. No. 702,950

Int. Cl.[2] G05B *19/28*

U.S. Cl. 318—603 **4 Claims**

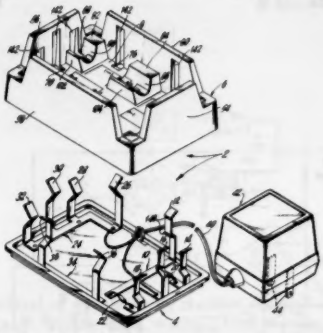


1. A position-correctable numerical control system for a machine wherein the position of an object along a path of travel is to be controlled without any device for detecting the absolute position of said object, said system comprising a reference mark detection pulse generator for determining a plurality of equidistantly-spaced reference marks providing standard ranges of control over the path of travel of said object, a non-volatile memory for storing in advance reference positions over the path of travel corresponding to said reference marks determined by said reference mark detection pulse generator, a comparator for comparing the actual position of said object on said path with a reference position stored in said non-volatile memory each time said object passes one of said reference marks, and means for correcting the position of said object on said path in accordance with a difference, if any, between said actual position and said reference position, so that the position of said object on said path is corrected each time it passes one of said reference marks.

4,101,818
MULTI-CELL BATTERY CHARGER

William Tolson Kelly, III, Wilton, Conn., and Francis Stahl, Rocky River, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,995
Int. Cl.[2] H01M 10/46
U.S. Cl. 320—2 11 Claims



1. A battery charger comprising a holder having a generally rectangular base with a pair of upstanding first and second side walls, an upstanding front wall and an upstanding rear wall; a first conductive terminal contact means having a first flexible upstanding conductive terminal member disposed adjacent to and interior of the first side wall and a second flexible upstanding conductive terminal member disposed adjacent to and interior of the rear wall; a second conductive terminal contact means having a first flexible upstanding conductive terminal member disposed adjacent to and interior of the second side wall and a second flexible upstanding conductive terminal member disposed adjacent to and interior of the rear wall; a third conductive terminal contact means having a flexible upstanding conductive terminal member disposed adjacent to and interior of the front wall; said second conductive terminal member of the first conductive terminal contact means and said second terminal member of the second conductive terminal contact means aligned substantially in the same plane and spaced apart from the conductive terminal member of the third terminal contact means by a distance to accommodate lengthwise a "D" size [about 2.25 inches (5.7 cm)] rechargeable cell in pressure contact therebetween; said first conductive terminal member of the first conductive terminal contact means disposed and spaced apart from said first conductive terminal member of the second conductive terminal contact means by a distance to accommodate two tandem series-connected "AA" size or "C" size [about 1.8 inches (4.8 cm)] rechargeable cells in pressure contact therebetween; said first conductive terminal contact means and said second conductive terminal contact means connected across a transformer and current rectifier adapted for plugging into a conventional alternating-current power supply line.

4,101,819
THREE PHASE CONTROLLING SYSTEM

Yasuyuki Maeda; Nobuo Mitsui, both of Katsuta; Tadao Kameyama, Ibaraki; Akinori Watanabe, Katsuta; Katsu Komuro, Katsuta, and Sadao Hokari, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

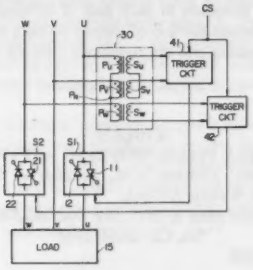
Filed Dec. 30, 1975, Ser. No. 645,344
Claims priority, application Japan, Jan. 6, 1975, 50-65
Int. Cl.[2] G05F 3/04
U.S. Cl. 323—24 5 Claims

1. In a three phase load control system including:

first and second bilateral switching circuits respectively connected in two of the three phase lines between a load and a power supply therefor,

trigger means for applying gating signals to said first and second bilateral switching circuits, and

a synchronizing circuit for providing electrical signals in synchronism with the frequency of the power supply voltage for said trigger means to provide a prescribed time base from which retard angles for the gating signals from said trigger circuit are referenced,

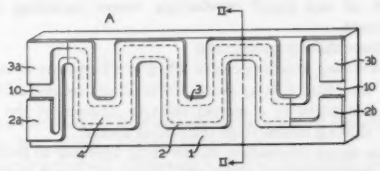


the improvement wherein said synchronizing circuit contains means for controlling said trigger means so that the gating signals, which are applied to the one of said bilateral switching circuits which is connected in the one of said two phase lines having the later phase, are advanced by a constant degree with respect to said later phase which constant degree is no greater than 120°, and the gating signals, which are applied to the other of said bilateral switching circuits, are synchronized to be in phase with the phase of the phase line in which said other bilateral switching circuit is connected.

4,101,820
FAIL-SAFE RESISTOR

Piero Montanari, Turin, Italy, assignor to WABCO Westinghouse, Turin, Italy

Filed May 2, 1977, Ser. No. 792,639
Claims priority, application Italy, May 6, 1976, 68105 A/76
Int. Cl.[2] H01C 7/12
U.S. Cl. 323—94 R 12 Claims



12. A fail-safe voltage divider network for supplying an output voltage which is a selected portion of an input voltage, comprising in combination,

(a) a first resistor having a preselected value,

(b) a second resistor comprising,

(1) a support element of fragile non-conducting material,

(2) two pair of terminals separately mounted on said support with one terminal and the other terminal of each pairs in associated relationships, each pair connected by a metallic strip deposited on said support element and whose continuity is interrupted by any breakage of said support element,

(3) resistance material coupled to form a resistor circuit of preselected value between the two metallic connector strips,

(c) said first resistor and said resistance material of said second resistor connected in a series circuit, including the one associated terminal of each pair of terminals of said second resistor, in which the preselected value of said resistance element represents a portion of the total series resistance equivalent to the desired portion of output voltage,

(d) an input voltage source connected to said series circuit, and

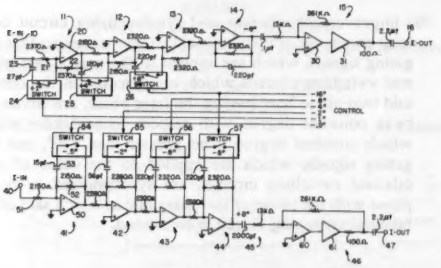
(e) an output voltage circuit connected across the other associated terminals of each pair of terminals for supplying the selected portion of output voltage only when the support element and the resistance element are unbroken.

4,101,821

VARIABLE PHASE SHIFTING APPARATUS

Thomas J. Kirby, Pelham, N.H., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 2, 1977, Ser. No. 792,509
Int. Cl.[2] G05F *1/68*
U.S. Cl. 323—119 **13 Claims**



1. Variable phase shifting apparatus including in combination

an input terminal for receiving an AC signal;

an output terminal;

a plurality of signal conducting means connected in series between the input terminal and the output terminal for conducting an AC signal received at the input terminal to the output terminal;

each of said signal conducting means including circuit means,

phase shifting means, and

switching means operable when in a first state to connect the phase shifting means to the circuit means and operable when in a second state to disconnect the phase shifting means from the circuit means,

the signal conducting means being operable to produce a predetermined phase shift in an AC signal conducted therethrough when the switching means is in said first state connecting the phase shifting means to the circuit means with respect to an AC signal conducted therethrough when the switching means is in said second state disconnecting the phase shifting means from the circuit means; and

switch control means coupled to each of the switching means for selectively switching each of the switching means to said first or said second state;

at least one of said signal conducting means including

a circuit means having an amplifier means and an input resistance connected thereto,

the phase shifting means being a reactance element, and

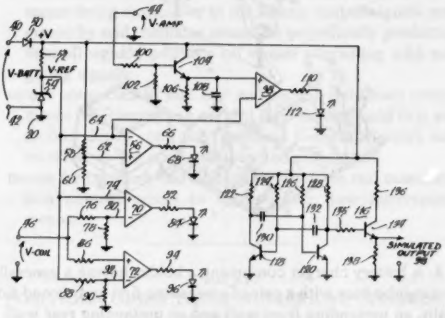
the switching means being operable when in said first state to connect the reactance element to the input resistance to provide a phase shifting network.

4,101,822

INSTRUMENT FOR TESTING A BREAKERLESS IGNITION SYSTEM

Daniel L. Doss, and Robert A. Melander, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Mar. 25, 1977, Ser. No. 781,510
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—16 R **16 Claims**



1. An instrument for testing a breakerless ignition system of an internal combustion engine having a battery, an ignition switch, an amplifier module, a coil, a distributor and spark plugs, the amplifier module providing a DC voltage to the coil and output pulses to the coil in response to rotation of a timing cam, the coil providing high voltage pulses to the distributor which distributes the high voltage pulses to the spark plugs comprising:

a first connecting means coupled to the battery;

means for establishing a reference voltage coupled to the first connecting means;

means coupled to said means for establishing a reference voltage and to the battery for comparing the reference voltage to the voltage provided by the battery;

means coupled to said means for comparing the reference voltage to the voltage provided by the battery for indicating whether the voltage provided by the battery exceeds the reference voltage;

a second connecting means coupled to the coil;

means coupled to said coil for comparing the DC voltage provided to the coil to a first and a second established voltage;

means coupled to said means for comparing the DC voltage provided to the coil to a first and a second established voltage for indicating whether the DC voltage provided to the coil is greater or less than the first established voltage;

means coupled to said means for comparing the DC voltage provided to the coil to a first and a second established voltage for indicating whether the DC voltage provided to the coil is greater or less than the second established voltage;

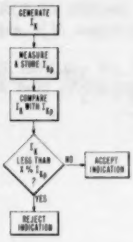
means coupled to said coil for determining the amplitude of the output pulses to the coil; and

means coupled to said means for determining the amplitude of the output pulses to the coil for indicating whether the amplitude of the output pulses exceeds an established voltage reference.

4,101,823
METHOD AND APPARATUS FOR MEASURING CATHODE EMISSION SLUMP

Felta Carl Farmer, Jr., Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,877
Int. Cl.[2] G01R *31/024*
U.S. Cl. 324—20 CR 7 Claims



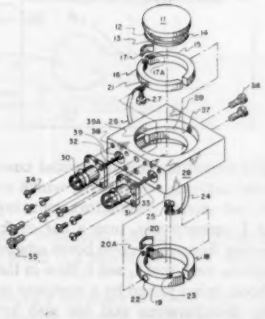
1. A method of measuring an electron emission slump of a cathode in a vacuum tube, wherein said vacuum tube is a cathode ray tube having at least one cathode, one control grid G1 and one screen grid G2 said method comprising the steps of:

(a) heating said cathode;
(b) applying ground potential to said cathode and G1 grid;
(c) applying a positive potential, E_{G2} to said G2 grid;
(d) increasing the magnitude of E_{G2} until a predetermined value of I_k is obtained;
(e) measuring a peak value, I_{kp}, of the cathode emission current I_k which is generated during a predetermined test period;
(f) comparing the magnitude of I_k with I_{kp} during said test period; and
(g) providing a failure indication if the magnitude of I_k becomes less than a predetermined percentage of I_{kp}.

4,101,824
TEST CELL HOLDER

Harold W. Breedlove, Woodbridge, and Walter L. Brown, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,592
Int. Cl.[2] G01R *31/024*
U.S. Cl. 324—20 R 8 Claims



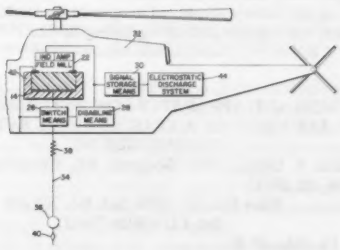
1. A test assembly for light detecting wafer test cell with circumferential electrodes comprising:

an optical bench means having an optical axis;
a standard cathode ray oscilloscope with scanned dot light source mounted on said bench means substantially centered on said optical axis;
a holding jig mounted on said bench means defining a passageway of a first uniform cross-section extending therethrough normal to said optical axis and also defining an aperture of a second smaller uniform cross-section substantially centered on said axis extending from the jig surface nearest said source into said passageway; and
a holder for said test cell slideably mounted in said passageway, said holder including,
a frame member with parallel sides, an outer cross-section normal thereto substantially equal to the cross-section of said passageway and a socket defined therein larger than and facing said aperture, said socket having the same shape but dimensions slightly greater than said test cell,
a pair of electrical terminals mounted on an external surface of said frame insulated from one another; and fastening means attached to said frame member to secure said test cell in a fixed position within said socket and electrically attach each of said electrodes to a different one of said terminals.

4,101,825
ELECTRIC FIELD SENSOR

Robert L. Truax, 116 Fifth St., Fort Myers, Fla. 33901

Filed Jan. 21, 1977, Ser. No. 760,933
Int. Cl.[2] G01R *5/28*
U.S. Cl. 324—32 7 Claims



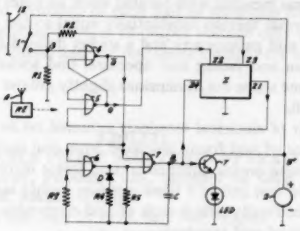
1. An electrostatic field measuring device for measuring the electric field outside a body comprising:

a. a sensor element comprising a plate of electrically conductive material electrically insulated from the body, the sensor plate being positioned wholly within the body,
b. a segment of dielectric material having a pair of opposite surfaces, a first of the pair of surfaces being fixed to the plate,
c. an electrometer means positioned within the body adjacent to the second of the pair of surfaces of said segment of dielectric material and arranged for measuring the electric field within said segment of dielectric material, the electrometer being calibrated to indicate the electric field outside the body on the basis of the measured electric field within the segment of dielectric material, and
d. an elongated linear member of electrically conductive material extending outward from said body, the elongated linear member being electrically connected to said plate and electrically insulated from the body.

4,101,826
FAULT INDICATOR INCLUDING A REED RELAY RESPONSIVE TO ABOVE NORMAL CURRENT FLOW IN A CONDUCTOR

Hendrik Horsitmann, Nesenhaus 22, 403 Ratingen, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,694
Int. Cl.[2] G01R 31/02, 19/16
U.S. Cl. 324—51 10 Claims

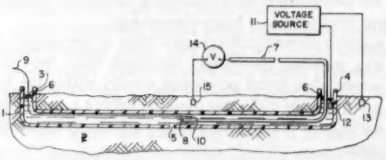


1. Fault circuit indicator, comprising:
- a reed contact relay to be placed into the magnetic field surrounding a conductor to be supervised as to any excess electrical current;
- an electronic latch connected to be operated by the reed contact to assume a first state upon closing of the reed contact;
- a pulse generator connected to be operated by the latch when the latch is in the first state, the latch inhibiting the generator when the latch is in a second state;
- a visible signalling device connected to the pulse generator to emit blinking signals in response to pulses when generated by the generator;
- an electronic counter also connected to the generator to count blinking pulses, and further connected to the latch to reset the latch to the second state after counting a particular number of pulses; and
- a long life battery connected to operate the latch, the generator, the counter and the signalling device.

4,101,827
METHOD AND APPARATUS FOR DETERMINING THE LOCATION OF A LEAK IN A PIPE BURIED UNDERGROUND

Franklin F. Offner, 1890 Telegraph Rd., Bannockburn, Deerfield, Ill. 60015

Filed Dec. 17, 1976, Ser. No. 751,891
Int. Cl.[2] G01R 27/02
U.S. Cl. 324—65 R 10 Claims

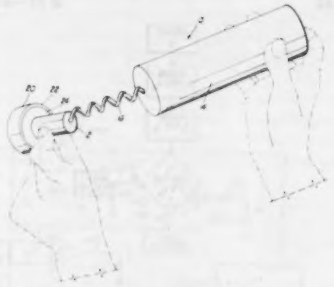


1. The method for determining the location of a leak in a pipe made of an electrically insulating material which is buried in a medium that is electrically conductive which comprises the steps of:
- at least partially filling the pipe with a fluid that is electrically conductive,
- passing an electrical current through the fluid in said pipe;
- measuring the electrical potential between said fluid and the medium in which said pipe is buried, and
- ascertaining the location of the leak from the measured potential.

4,101,828
CORROSION DETECTOR

William H. Dehler, Wichita, Kans., assignor to The Boeing Company, Wichita, Kans.

Filed May 3, 1977, Ser. No. 793,403
Int. Cl.[2] G01R 27/02
U.S. Cl. 324—65 R 8 Claims

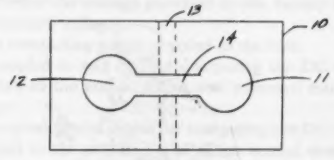


1. A corrosion detector for indicating chemical corrosion on a metal surface and when the surface should be washed, the detector comprising:
- a filter paper for placing on the metal surface to be tested, said filter paper saturated with a solution of water, the water in said filter paper combining with the chemicals on the metal surface to form a chemical solution in said filter paper;
- a probe disposed on top of said filter paper, said probe passing an electrical current through the chemical solution in said filter paper; and
- a battery operated wash meter electrically connected to said probe, said wash meter including means for measuring the electrical resistance of the chemical solution and indicating whether the metal surface should be washed.

4,101,829
DIFFERENTIAL CURRENT DETECTOR

Robert J. Gomperts, Herentals, and Gerard M. V. Driesen, Borgerhout, both of Belgium, assignors to GTE International, Inc., Stamford, Conn.

Filed Apr. 13, 1977, Ser. No. 787,291
Claims priority, application Belgium, Jul. 7, 1976, 843853
Int. Cl.[2] G01R 19/10, 33/00; H01H 47/32
U.S. Cl. 324—126 5 Claims



5. A method of measuring the differential current between two direct current carrying conductors, which comprises:
- inserting first and second conductors, carrying direct current I_1 and I_2 respectively, into a bar of ferromagnetic material having first and second bores adapted to receive said conductors, such that I_1 and I_2 flow in the same direction, said holes being joined by a coplanar slot extending transversely therebetween said bar also having a third bore whose center line is orthogonal to a plane containing said first and second, said bore extending through said slot;
- placing into said third bore a reed capsule switch having two mutually exclusive conductive states, said switch being

responsive to the flux generated by I_1 and I_2 in said first and second conductors;

measuring the conductive state of said reed capsule switch; and

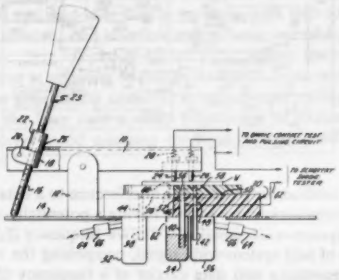
detecting a change in state in said switch at the instant $|I_1 - I_2|$ exceeds a predetermined current level.

4,101,830

MERCURY PROBE

John H. Greig, Massapequa, N.Y., assignor to MSi Electronics Inc., Woodside, N.Y.

Filed Feb. 15, 1977, Ser. No. 768,824
Int. Cl.² G01R *1/06, 31/22;* H01R *3/04*
U.S. Cl. 324—158 F **11 Claims**



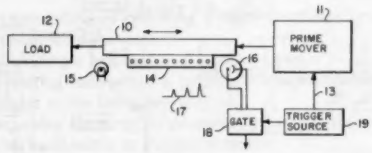
9. Electrical test apparatus including a support, an orifice plate on the support, said orifice plate having a flat surface for supporting a flat test wafer, said support and said orifice plate having aligned bores extending to an aperture in said flat surface, means for developing vacuum at the flat surface of the orifice plate at and near said aperture but only when a test wafer is disposed thereon for elevating mercury through said aligned bores to said aperture to form an electrode engaging a wafer on the orifice plate, said orifice plate being separably received on the support for providing a desired electrode area in the orifice plate.

4,101,831

LOAD MONITORING APPARATUS AND METHOD

Robert F. Dumbeck, Elgin, Tex., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 675,780, Apr. 12, 1976, which is a continuation-in-part of Ser. No. 548,011, Feb. 7, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,736
Int. Cl.² G01P *3/48*
U.S. Cl. 324—166 **7 Claims**



1. Apparatus displaying changes in loading by observing variations of speed of a moving element, comprising in combination,

means deriving a sequence of timing pulses from movement of said element thereby identifying the speed of movement,

means sampling pulses from said sequence,

means responsive to sampled pulses to produce control pulses of predetermined duration,

means deriving a load indicia pulse of duration substantially equal to that between sampled speed pulses and successive pulses in said sequence,

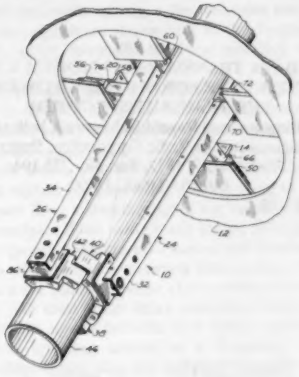
means comparing the lengths of said control and load pulses, and load display means responsive to the comparison to provide an electrical indicia signal varying as a function of the load on said moving element.

4,101,832

MULTIPROBE EDDY CURRENT FLAW DETECTION DEVICE WITH MEANS TO RAISE AND LOWER THE INDIVIDUAL PROBES

Richard G. Baker, Cleveland Heights; Joseph P. Vild, Lyndhurst; Charles Griesfelder, and Donald P. Fox, both of Cleveland, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 82,051, Oct. 19, 1970, abandoned. This application Feb. 28, 1975, Ser. No. 554,167
Int. Cl.² G01R *33/12*
U.S. Cl. 324—227 **1 Claim**



1. In an eddy current flaw detection device for detecting defects in a workpiece as the workpiece travels along a work path;

(a) energizing means for causing a current to circulate in the workpiece in an inspection station along the path;

(b) a plurality of pickup arms each pivotally mounted for movement toward and away from the path between inspection and storage positions;

(c) a plurality of sets of individual sensing coils with each set of coils mounted on and supported by a corresponding and different one of said pickup arms;

(d) said sets of sensing coils substantially completely surround a circumference of a workpiece when the sets of sensing coils are in proximity with the workpiece and the arms are moved in their sensing positions;

(e) the individual sensing coils in each set being rigidly secured in spaced relationship with respect to each other for sensing changes in the current over a circumferential area of the workpiece;

(f) a plurality of actuators respectively coupled to a corresponding one of said plurality of pickup arms for moving the respective pickup arms to their storage positions for maintaining the sensing coils out of proximity with the workpiece path and to move the arms to their inspection positions for maintaining the sensing coils in proximity with the workpiece;

(g) each of the sets having an edge which is a leading edge with respect to the direction of workpiece travel along the path;

(h) resilient shield means projecting in front of the leading edge of at least one set;

(i) spring means for urging the at least one set away from the path until the shield means is between said leading edge

and the path to protect the sensing set from collision with a workpiece advancing along the path into the station;

(j) a plurality of bridge circuit means coupled to a respective set of sensing coils, each bridge circuit means having an input circuit coupled to the corresponding set of sensing coils and an output circuit for developing a control signal having a value representative of a level of unbalance on the corresponding set of sensing coils; and,

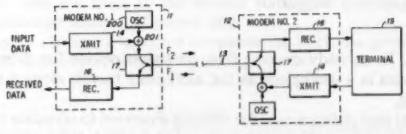
(k) a like plurality of indicator circuit means each of which are coupled to the output circuit of a corresponding bridge circuit means for receiving the value of said control signal and developing an output signal indicative of both the occurrence and location of a flaw in the workpiece when the value of the control signal exceeds a predetermined value.

4,101,833

DUPLEX DATA TRANSMISSION MODEM UTILIZING AN INJECTED TONE FOR SHIFTING POWER WITHIN THE TRANSMIT SPECTRUM

John A. C. Bingham, and Ronald K. Maxwell, both of Palo Alto, Calif., assignors to The Vadic Corporation, Sunnyvale, Calif.

Filed Mar. 7, 1977, Ser. No. 775,104
Int. Cl.[2] H04L *27/00*
U.S. Cl. 325—30 **5 Claims**



1. In a duplex data transmission modem having a first mode of operation in which outgoing data is transmitted by modulating a carrier frequency **F1** and incoming data is received by a demodulation of a data modulated carrier frequency **F2** which is greater than said frequency **F1** and a second mode of operation in which data is received by demodulation of said carrier frequency **F1** and is transmitted by modulation of said carrier frequency **F2**, a method of insuring that the power transmitted in a first band of frequencies extending from a frequency **F3** to a frequency **F4** does not exceed the power transmitted outside said first band of frequencies by a prescribed ratio in order to prevent interference with single frequency signaling systems operating at a frequency within said first band from **F3** to **F4**, comprising the steps of:

operating said modem modulator in said second mode of operation; and

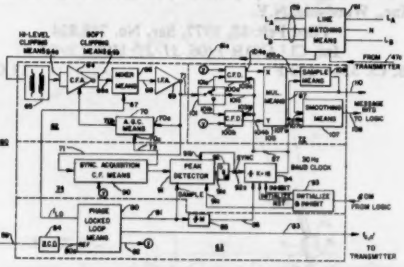
injecting a single-frequency tone **F6** in the outgoing data transmission path, the power level of said injected tone being such that sufficient power is added to the band outside said first band so that the power in said first band does not exceed the power outside of said first band by said prescribed ratio for any transmittable data pattern.

4,101,834

METHODS AND APPARATUS FOR REJECTION OF INTERFERENCE IN A DIGITAL COMMUNICATIONS SYSTEM

Charles A. Stutt, Rexford, and Richard W. Rankin, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,551
Int. Cl.[2] H04L *1/00*
U.S. Cl. 325—42 **19 Claims**



1. A method for minimizing interference to a data carrier in a data communications system having a potentially-interfering signal system-wide signal at a known frequency (f_S) and harmonics of said system-wide signal, comprising the steps of:

(a) generating said data carrier at a frequency (f_C)substantially midway between an adjacent pair of the N-th and the N+1-st harmonics of said system-wide single signal; and

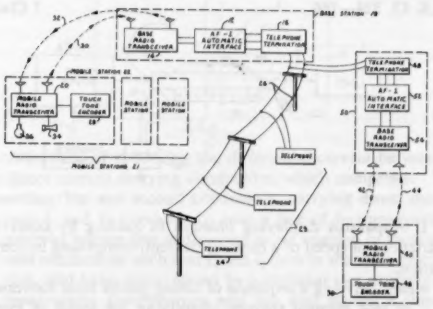
(b) locking the frequency (f_C) of said data carrier to an odd multiple (2N+1) of the first subharmonic ($f_{S/2}$) of the known frequency (f_S) of said single system-wide signal such that $f_C=(2N+1)(f_S/2)$, where N is an integer greater than zero, to maintain the frequency of said data carrier with essentially equal frequency seapration from each of said adjacent pair of harmonics even if said known frequency varies.

4,101,835

METHOD AND ELECTRONIC CONTROL DEVICE FOR RADIO TELEPHONE COMMUNICATION

Frank D. Taylor, and Ronald J. Novotny, both of Omaha, Nebr., assignors to General Communications Co., Inc., Omaha, Nebr.

Filed May 7, 1976, Ser. No. 684,304
Int. Cl.[2] H04B *3/60, 5/04*
U.S. Cl. 325—55 **30 Claims**



1. Apparatus for communication between a half duplexed frequency radio system, and a plurality of telephone subscriber subsets operable to generate a plurality of tone signals for calling other subsets and for providing coded enabling and disabling signals, each said telephone subscriber subset having

an individual dial number and being interconnected with a telephone dial network, one of said subsets being connected to and having a dial number associated with said radio system, said apparatus comprising:

a plurality of mobile ratio units each equipped with a receiver having an operating frequency channel f_1, a transmitter having an operating frequency channel f_2, and pushbutton operated tone generating means connected to said mobile unit transmitter, said mobile unit transmitter operative in response to manual operation of said tone generating means to transmit tone signals;

a base station radio having the combination of a radio transmitter having said operating frequency channel f_1, and a radio receiver having said operating frequency channel f_2; and

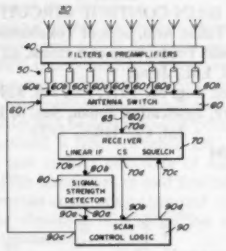
interface means for interconnecting said base station transmitter and said base station receiver with said telephone dial network, said interface means being operable to couple a calling telephone subset with the base station radio receiver in response to ring pulse signals from said calling subset and further operable to couple said calling subset with the base station radio transmitter in response to a properly coded enabling tone signal from said calling subset.

4,101,836

SECTORED ANTENNA RECEIVING SYSTEM

Timothy Philip Craig, Georgetown, Ky., and James Roy Stimple, Hoffman Estates, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1977, Ser. No. 792,963
Int. Cl.[2] H04B 7/08
U.S. Cl. 325—302 **24 Claims**



15. The method of receiving a radio frequency broadcast signal comprising the steps of:

(a) providing a multisectored antenna array;

(b) orienting each sector in predetermined relationship with respect to the remaining sectors;

(c) scanning the array by sequentially switching the signal from each sector to a receiver means;

(d) detecting, via the receiver means, the strength of the signal from each sector;

(e) comparing said signal strengths to a reference level and determining the condition of the signal strength level of at least one sector exceeding said reference level;

(f) continuing scan for a predetermined interval subsequent to determination of a sector signal strength exceeding said reference level; and

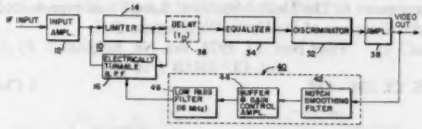
(g) inhibiting scan following said predetermined interval and coupling the receiver to that sector which produced the greatest detected signal strength.

4,101,837

THRESHOLD EXTENSION FM DEMODULATOR APPARATUS FOR WIDE BAND WIDTH FM SIGNALS

Lorimer Clayton, Jr., Stone Mountain, and Elias J. Livaditis, Tucker, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed May 11, 1977, Ser. No. 795,991
Int. Cl.[2] H04B 1/10; H04N 5/44; H03D 3/00
U.S. Cl. 325—347 **11 Claims**



1. For use in apparatus for demodulating FM signals which carry wide band-width modulation, such as color televison signals, said apparatus having a discriminator circuit for providing output signals corresponding to the frequency of said FM signals, noise threshold extension circuitry which comprises

(a) an amplitude limiter, said limiter being connected to provide said FM signals to said discriminator,

(b) a tunable bandpass filter connected in regenerative feedback relationship across said limiter, and

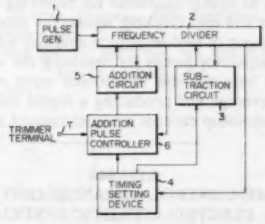
(c) circuit means responsive to said discriminator circuit output signals for generating and applying to said tunable bandpass filter a steering signal for varying the tuning of said bandpass filter, said circuit means having an attenuation response characteristic across said bandwidth with a region of increased attenuation intermediate of said bandwidth and a phase response characteristic which provides about 360° total phase delay, including delays in the path of said FM signals between said limiter and said generating and applying means, at a frequency within said bandwidth higher than the highest frequency occupied by said region.

4,101,838

CLOCK PULSE GENERATING APPARATUS

Mitsuo Aihara, Tokyo; Tsuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,714
Claims priority, application Japan, Jan. 28, 1976, 51-8135
Int. Cl.[2] H03K 3/72, 1/16
U.S. Cl. 328—63 **11 Claims**



1. A clock pulse generating apparatus comprising a pulse generator for generating a pulse signal of a predetermined cycle; a frequency divider including a plurality of frequency division stages so as to frequency divide an output pulse of the pulse generator; pulse subtracting means for subtracting at a predetermined ratio the number of pulses passing through one frequency division stage in the frequency divider; pulse adding means for adding at a predetermined ratio the number of pulses passing through another frequency division stage in the fre-

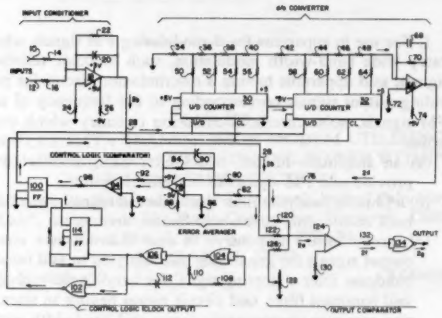
quency divider; timing setting means for imparting an operation timing to said pulse subtracting means and said pulse adding means and control means including at least an external operation terminal for variably controlling at least one of the adding ratio of said pulse adding means and the subtracting ratio of said pulse subtracting means.

4,101,839

ANALOG-DIGITAL RATIO DETECTOR

Lynn A. Poole, and Harry M. Crain, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1974, Ser. No. 527,666
Int. Cl.² H03B *1/00*
U.S. Cl. 328—165 **5 Claims**



1. A ratio detector circuit for producing a gated output whenever the average amplitude of an information pulse exceeds a predetermined threshold in the presence of interfering background noise comprising:

input conditioning means for inverting and smoothing an input signal to said detector;

a feedback loop coupled to the output of said input conditioning means for establishing the average amplitude of said input signal and storing said average, said feedback loop comprising:

an error averager for determining the difference in amplitude between said conditioned input signal and said stored average;

control logic for determining the polarity of said amplitude difference and triggering an output indicative of said polarity, and for generating clocking signals to control the effective amplitude average of said detector;

a digital to analog converter for receiving said indicative output and said clocking signals for producing an analog output of said amplitude average; and

output comparator means for detecting the amplitude relationship between said conditional input signal and said analog average and producing a digital output whenever said relationship exceeds a predetermined ratio threshold.

4,101,840

VOLUME CONTROL ARRANGEMENT FOR AN ELECTRO-ACOUSTIC SYSTEM

Jobst Fricke, Cologne, and Helmut Reuter, Euskirchen, both of Fed. Rep. of Germany, assignors to CMB Colonia Management und Beratungsgesellschaft mbH & Co. KG, Cologne, Fed. Rep. of Germany

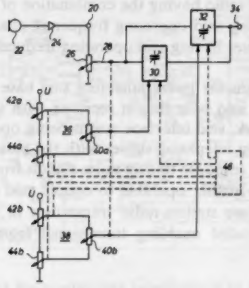
Filed Jun. 1, 1976, Ser. No. 691,639
Int. Cl.² H03F *3/68;* H03G *3/00*
U.S. Cl. 330—127 **7 Claims**

1. In an electro-acoustic system, a volume control arrangement having an adjustable amplification factor and a frequency characteristic dependent thereon and comprising:

an input terminal for receiving an input audio signal characterised by at least one formant region defined by a maximum in the amplitude/frequency characteristic curve of the signal;

a volume control in the form of a signal magnitude adjuster connected on one side to the input terminal;

a frequency selective amplifier circuit having its input connected to the other side of the volume control and its output connected to an output terminal, said circuit including elements which define a pass range in the audio frequency region, the frequency position of said pass



range being variable by adjustment of a control voltage applied to said elements; and

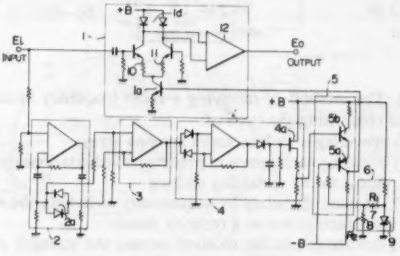
means for generating said adjustable control voltage, said means including a device which is adjustable by operation of the volume control in such a manner that the output signal at the output terminal has a formant region the frequency position and amplitude of which is shifted, relative to the position and amplitude of the formant in the input signal, in response to adjustment of the volume control.

4,101,841

GAIN CONTROL CIRCUIT

Shigeru Okada; Takao Arai, both of Yokohama; Kouichi Tomatsuri, and Hiroshi Toeda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 30, 1977, Ser. No. 829,244
Claims priority, application Japan, Sep. 3, 1976, 51-104836
Int. Cl.² H03G *3/30*
U.S. Cl. 330—254 **3 Claims**



1. A gain control circuit comprising:

a gain control section including at least a differential amplifier with which diodes or transistors arranged to act as diodes are connected as a load and the gain of which is controlled by a control signal;

a control signal section including at least a logarithmic compression circuit and an exponential expansion circuit for the logarithmic compression and exponential expansion of an input signal applied to said differential amplifier, said control signal section applying its output signal to a con-

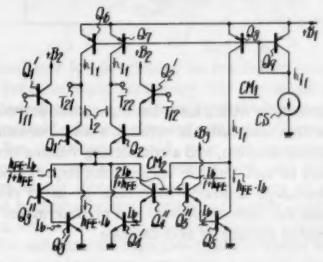
trol terminal of said gain control section as said control signal; and

a temperature compensation circuit connected to a bias terminal of a transistor in the last stage of said control signal section to provide a temperature-dependent bias voltage which cancels the temperature dependence of said control signal section and that of said gain control section.

4,101,842
DIFFERENTIAL AMPLIFIER

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 1, 1977, Ser. No. 829,962
Claims priority, application Japan, Sep. 3, 1976, 51-105975
Int. Cl.² H03F 3/45
U.S. Cl. 330—257 8 Claims



1. A differential amplifier comprising:

first and second differentially connected transistors each having base, emitter and collector electrodes, at least one input terminal, means connecting each said input terminal with the base electrode of a respective one of said differentially connected transistors, at least one output terminal, and means connecting each said output terminal with the collector electrode of a respective one of said differentially connected transistors;

first current mirror circuit means including third, fourth and fifth transistors and a P-N junction, each of said third, fourth and fifth transistors having base, emitter and collector electrodes, said P-N junction being connected in parallel with the base-emitter junctions of said third, fourth and fifth transistors and having the same polarity as said base-emitter junctions, a first reference DC terminal, means connecting said emitter electrode of each of said third, fourth and fifth transistors to said first reference DC terminal, and means connecting each said output terminal to the collector electrode of a respective one of said third and fourth transistors;

second current mirror circuit means including first, second and third pairs of Darlington-connected transistors each having base, emitter and collector electrodes, said first and second pairs of Darlington-connected transistors having the collector electrodes thereof connected in common to the emitter electrodes of said first and second differentially connected transistors, each of said pairs of Darlington-connected transistors having the emitter electrode of one of the transistors thereof connected to the base electrode of the other transistor of the respective pair, a second reference DC terminal connected to the emitter electrodes of said other transistors of said pairs of Darlington-connected transistors, and means connecting together the base electrodes of said one transistors of said first, second and third pairs of Darlington-connected transistors;

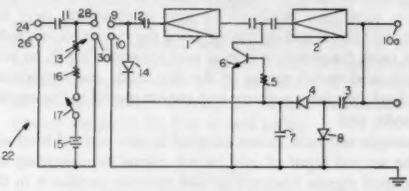
circuit means connecting said collector electrode of said other transistor of said third pair of Darlington-connected transistors to said base electrode of said one transistor of said third pair of Darlington-connected transistors and to the collector electrode of said fifth transistor; and

current source means connected to said P-N junction at the side of the latter remote from said first reference DC terminal.

4,101,843
AUTOMATIC RECORDING LEVEL CONTROL CIRCUIT WITH MANUAL SENSITIVITY COMPENSATING CIRCUIT

Eiji Aoyama, Tokyo, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Dec. 2, 1976, Ser. No. 746,780
Int. Cl.² H03G 1/02
U.S. Cl. 330—280 10 Claims



1. For use with a sound movie camera having an automatic sound level control circuit in which the gain of a pair of cascaded amplifiers is controlled by the conduction of an active control element having an input terminal receiving a conduction control signal representative of the amplitude of the output of the cascaded amplifiers, a variable sensitivity control circuit for remote control, comprising:

a housing for the control circuit;

a voltage source within said housing; and

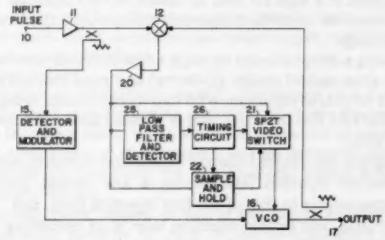
a variable impedance element in said housing and serially coupled between said voltage source and the input terminal of the active control element said coupling detachably associated with the camera for remote manual adjustment of the sensitivity control circuit,

whereby a selectable amount of control current is provided through said voltage source and said variable impedance element for selectively controlling the conduction of the active control element for selectively varying the combined gain of the cascaded amplifiers.

4,101,844
OSCILLATOR APPARATUS ADAPTED TO LOCK ONTO A SINGLE PULSE OF RADIO FREQUENCY WAVES

Hugh Robert Malone, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 11, 1977, Ser. No. 814,511
Int. Cl.² H03B 3/04
U.S. Cl. 331—10 3 Claims



1. Oscillator apparatus adapted to lock onto a single pulse, or burst, of radio frequency waves comprising:

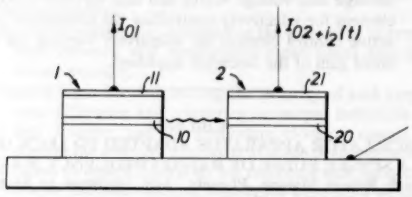
(a) an apparatus input adapted to receive the single pulse, or burst, of radio frequency waves;
(b) a variable oscillator having an output and a control input;
(c) switch means having an output connected to the control input of said variable oscillator and having first, second and control inputs, said switch means operating to connect the first input to the output thereof in a first mode and the second input to the output thereof in a second mode;
(d) a control loop connected to the control input of said variable oscillator through the first input of said switch means for providing a control signal to lock the output of said variable oscillator to the frequency of the radio frequency waves during the first mode of said switch means;
(e) timing means coupled to the control input of said switch means and further coupled to said control loop through a low pass filter designed to pass substantially only the control signal and operating, upon the reception of a pulse of radio frequency waves at said apparatus input, to activate said switch means to the first mode and a predetermined time later activate said switch means to the second mode; and
(f) sample and hold means coupled to said control loop and the second input of said switch means for sampling the control signals controlling said variable oscillator in the first mode, holding the sampled signals, and applying the sampled signals to the control input to control said variable oscillator when said switch means switches to the second mode.

4,101,845

METHOD OF AND ARRANGEMENT FOR PRODUCING COHERENT MODE RADIATION

Peter Russer, Ulm (Donau), Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 26, 1976, Ser. No. 670,824
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514140; Oct. 31, 1975, 2548796
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 M **17 Claims**



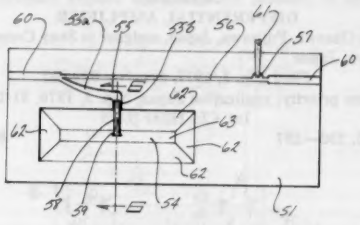
1. A method of producing coherent mode pure radiation modulated at a high bit rate, by means of two injection lasers which may be controlled separately but are optically coupled, comprising:
passing a direct current through a first injection laser having a good optical quality (Q-factor) and good spectral purity of its output radiation, with said direct current being such that said first injection laser is pumped above its threshold value,
coupling the output radiation of said first injection laser to a further injection laser having a low optical quality in comparison to that of the first injection laser, and
operating said further injection laser in an oscillating mode to provide the desired modulated coherent mode radiation by biasing the further injection laser by passing a direct current through it and controlling the output radiation of said further injection laser additionally by superimposing a modulation current on its direct current.

4,101,846

GAS LASER

Michael E. Fein, Toledo, and Charles W. Salisbury, Rising Sun, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 546,240, Feb. 3, 1975, Pat. No. 3,991,385. This application Jul. 16, 1976, Ser. No. 705,854
Int. Cl.² H01S 3/00
U.S. Cl. 331—94.5 D **3 Claims**



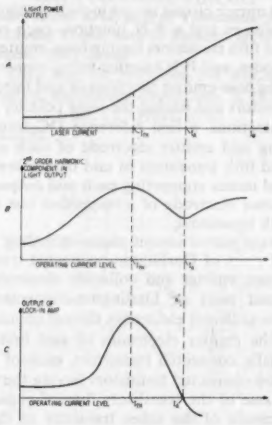
1. A combination with a laser having a cathode volume and a cathode within said cathode volume, a laser bore containing a lasing gaseous medium, and a connecting volume connecting the laser bore to said cathode volume, the improvement comprising a discharge insertion tube bent so as to release the discharge into the cathode volume at a predetermined distance from the nearest surface of said cathode.

4,101,847

LASER CONTROL CIRCUIT

Andres Albanese, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 1, 1976, Ser. No. 737,846
Int. Cl.² H01S 3/13
U.S. Cl. 331—94.5 S **11 Claims**

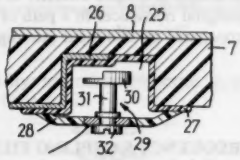


1. Apparatus for controlling the operating current level of an injection laser so that said injection laser operates at the point of maximum linearity comprising:
means for modulating the current through said injection laser with a test signal at a predetermined frequency; and
means for detecting the harmonic distortion component in the light output of said laser at twice said predetermined frequency and for automatically adjusting said operating current level for the minimum harmonic distortion component.

4,101,848
OSCILLATOR

Shiro Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,466
Claims priority, application Japan, Oct. 21, 1975, 50/126794
Int. Cl.[2] H03B 5/36
U.S. Cl. 331—116 R 4 Claims

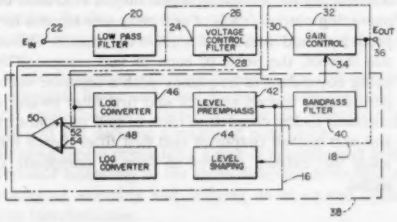


1. An oscillator for developing an oscillatory output signal having a predetermined frequency, for use in an electronic timepiece, comprising: a miniature crystal vibrator element; a case housing said vibrator element with said vibrator element mounted for vibration in said case; an integrated circuit mounted on said case and comprising with said vibrator element an oscillator circuit having a frequency of oscillation determined by said vibrator element; a trimmer capacitor, said case having an exterior surface portion having a recess formed therein with said trimmer capacitor position within said recess; and means having low stray capacitances electrically connecting said vibrator element and said integrated circuit and said trimmer capacitor to define said oscillator circuit with said trimmer capacitor effective to alter the frequency of oscillation of said oscillator circuit, whereby said oscillator circuit is substantially insensitive to external electric fields.

4,101,849
ADAPTIVE FILTER

David E. Blackmer, Wilton, and C. Rene Jaeger, South Lyndeboro, both of N.H., assignors to DBX, Inc., Waltham, Mass.

Filed Nov. 8, 1976, Ser. No. 739,428
Int. Cl.[2] H04B 1/64
U.S. Cl. 333—14 13 Claims



1. A companding system for use in signal transmission of an encoded signal derived from an electrical input signal, said system comprising, in combination:

an input terminal;

an output terminal;

means coupled between said input and output terminals for providing a pair of parallel transmission paths, the first of said paths having a substantially fixed transmission frequency range, the second of said paths providing transmission over a frequency range which is variable responsively to the amplitude of a first control signal, the frequency transmission characteristic of one of said two paths being within a relatively high range of frequencies and the frequency transmission characteristic of the other of said two paths being within a range of relatively low frequencies;

means for combining the output of said two paths to provide a combined signal along a single path;

means for sensing the amplitude of selected relatively low frequency components of said encoded signal and for providing a second variable control signal logarithmically related to the rms value of the amplitude of said relatively low frequency components;

means for sensing the amplitude of selected relatively high frequency components of said encoded signal and for providing a third variable control signal logarithmically related to the RMS value of the amplitude of said relatively high frequency components;

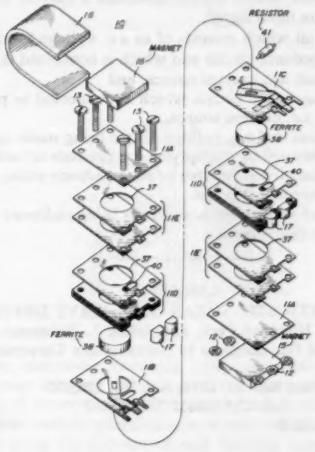
means for comparing said second and third control signals so as to provide said first control signal related to the comparison of said second and third control signals; and

amplifying means coupled between said input and output terminals in series with said parallel transmission paths having a gain variable responsively to the one of said second and third control signals which is logarithmically related to the rms value of the amplitude of the frequency components which correspond to the transmission frequency range of the first of said paths.

4,101,850
UHF ISOLATOR USING STACKED CONDUCTOR SHEETS

Lawrence Noah Dworsky, Coral Springs, and Jeffery Alden Whalin, Hialeah, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1977, Ser. No. 788,398
Int. Cl.[2] H01P 1/36
U.S. Cl. 333—24.2 14 Claims



1. An improved broadband two-port isolator for use in high frequency electronic apparatus and comprising in combination:

gyromagnetic members;

resistor means;

a plurality of substantially parallel, contiguous planar members, each member having essentially the same dimensions in the major plane, being formed of a conductive material, at least some of the members having apertures formed therein for receiving the gyromagnetic means and the resistor means;

insulating means affixed to two of the planar members for insulating portions of each of the two members from adjacent planar members; and

magnetic means placed adjacent the planar members for producing a static magnetic field in a direction essentially perpendicular to the planes of the planar members, the magnetic field being essentially uniform in the gyromag-

netic means; a first end of the resistor means electrically contacting one of the said two planar members and a second end of the resistor means electrically contacting the other one of the said two planar members;

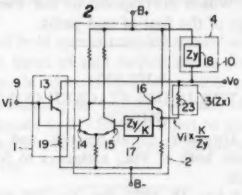
and wherein the two of the planar members comprise inductive lines between the gyromagnetic members, having the axis of one inductive line perpendicular to the axis of the other inductive line, and also wherein predetermined portions of the planar members comprise tuning elements for said inductive lines.

4,101,851

VARIABLE EQUALIZER

Kohei Ishizuka, and Yasuhiro Kita, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,057
Claims priority, application Japan, Dec. 1, 1975, 50/142246
Int. Cl.[2] H03H *5/00*; H03G *11/04*
U.S. Cl. 333—28 R **2 Claims**



1. A variable equalizer, comprising:

an a.c. current source which generates a current proportional to an input signal,

a series circuit which consists of an a.c. voltage source and a first impedance circuit and which is connected in parallel with said a.c. current source, and

a second impedance circuit which is connected in parallel with said a.c. current source,

a voltage from said a.c. voltage source being made equal to a value obtained by multiplying a magnitude of said input signal by an inverse number of an impedance value of said second impedance circuit,

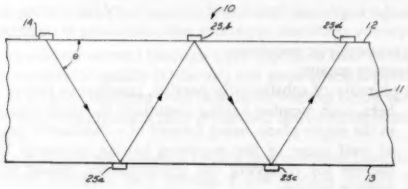
at least one of said impedance circuits being endowed with a frequency characteristic.

4,101,852

MICROACOUSTIC SHEAR BULK WAVE DEVICE

Max Epstein, Highland Park, and Ashok L. Nalamwar, Freeport, both of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Sep. 21, 1976, Ser. No. 725,195
Int. Cl.[2] H03H *7/30, 7/10*
U.S. Cl. 333—30 R **8 Claims**



1. A microacoustic shear bulk wave device comprising

a substrate having a principal surface and a second surface opposed to said principal surface;

an input interdigital transducer supported on said principal surface and comprising a plurality of interdigital electrodes, a piezoelectric layer adjacent said electrodes, and a conductive film adjacent said piezoelectric layer, and

an output transducer adjacent said second surface of said substrate;

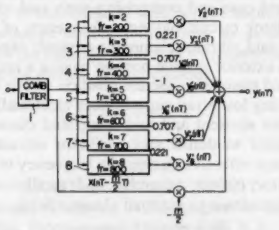
wherein ultrasonic wave energy is propagated by said input interdigital transducer at an angle ϕ which is not an angle substantially normal to said principal surface, said angle ϕ being a function of thickness of the piezoelectric layer and periodicity of the input interdigital transducers, and said output transducer is located laterally of a normal to said input interdigital transducer in a path of ultrasonic wave energy propagated by said input interdigital transducer.

4,101,853

FREQUENCY SAMPLING FILTER

Hiroshi Kosugi, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Sep. 8, 1976, Ser. No. 721,408
Claims priority, application Japan, Sep. 12, 1975, 50-109989
Int. Cl.[2] H03H *7/08, 7/14, 7/30*
U.S. Cl. 333—70 R **8 Claims**



1. A frequency sampling filter comprising:

first filter means having an input for receiving an input signal and first and second outputs, the transfer function between said input and said first output having a plurality of periodically spaced zeros, said second output providing an output of the input signal delayed by a predetermined time;

second filter means coupled to said first output of said first filter means and including a plurality of resonator circuits providing outputs, each of said resonator circuits having a predetermined number of poles in the transfer characteristics thereof, the poles of each of said resonator circuits being coincident in frequency with a separate one of the periodically spaced zeros of said first filter means; and

summation means coupled to each of said resonator circuits and said second output of said first filter means for summing the outputs thereof to form a composite output signal.

4,101,854

TUNABLE HELICAL RESONATOR

Emanuel Gikow, deceased, late of Ocean, N.J. (by Ida M. Gikow, executrix), and Richard S. Tilton, Oceanport, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

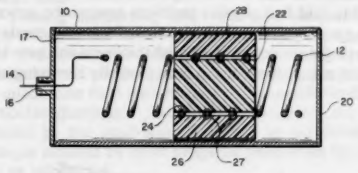
Filed Jan. 28, 1977, Ser. No. 763,384
Int. Cl.[2] H01P *7/04*
U.S. Cl. 333—82 B **12 Claims**

1. A RF tuneable resonator comprising:

a metallic cylindrical shield;

a helical coil axially positioned within said metallic shield and including a RF coupling means at one end thereof;

a first axially moveable dielectric means intermediate said metallic shield and said helical coil; and



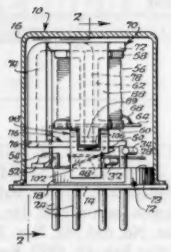
a second axially moveable dielectric means positioned within said helical coil.

4,101,855

MINIATURE RELAY

Donald R. Drapeau, Windsor, Conn., assignor to Hi-G Incorporated, Windsor Locks, Conn.

Filed Nov. 5, 1976, Ser. No. 739,210
Int. Cl.² H01H *50/02*
U.S. Cl. 335—106 **30 Claims**



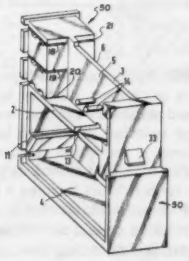
1. A miniature relay comprising:
(a) a support header having a plurality of terminal pins extending therethrough:
(b) a pair of fixed contact members each electrically coupled to a corresponding one of said terminal pins and positioned on one side of said header;
(c) a movable contact member carried by said header and electrically coupled to another of said pins, said contact member having a portion movable between said fixed contact members and normally engaging one of said members;
(d) an electromagnet assembly comprising a coil carried by a magnetic frame, said coil having a magnetic core and said frame having a portion operatively associated with said coil and defining a magnetic pole piece;
(e) holding means comprising a pair of spaced-apart holding elements extending in the same direction from said electromagnet assembly and defining an elongated open region therebetween;
(f) means for supporting said coil and magnetic frame on said header in spaced relation to said one side of said header with said holding means facing said header;
(g) an armature located in spaced relation to said header and having a first portion operatively engaging said movable contact, a second portion operatively associated with said pole piece and a third portion shaped and dimensioned to be received in said open region between said holding elements in a manner permitting limited angular movement of said armature relative to said open region along a plane disposed between said holding elements; and
(h) biasing means supported by said header and engaging said armature in a manner urging said armature third portion into said open region between said holding elements normally so that said armature first portion allows said movable contact to engage said one of said fixed contact members and said armature second portion is spaced from said pole piece;
(i) whereby in response to electrical energization of said coil said armature second portion is attracted to said pole piece thereby moving said armature against said biasing means causing said first portion to move said movable contact into engagement with the other of said fixed contact members.

4,101,856

ELECTRICAL SWITCHING RELAY CONSTRUCTION AND HOUSING THEREFOR

Ernst Dürr, Ebhausen, Germany, assignor to Fritz Kölle, Germany

Filed Mar. 30, 1977, Ser. No. 782,704
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2614942
Int. Cl.² H01H *50/04*
U.S. Cl. 335—135 **7 Claims**



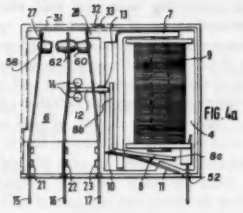


FIG. 4a

5. An electronic switching relay, comprising an integral single-part housing skeletal structure of insulating material having an interior space, first and second partition walls disposed substantially perpendicular to each other in said housing and dividing the interior of said housing into an armature chamber and first and second spring contact chambers, said housing including first and second sets of spring holder slots defined therein extending from the exterior of said housing into respective ones of said first and second spring contact chambers, respective spring contacts positioned in respective ones of said contact holder slots having exterior portions forming terminals extending to the exterior of said housing and having interior portions with contacts thereon, at least one of said spring contacts being movable relative to the others in order to position it into contact engagement or release from contact engagement therewith, said first partition wall separating said armature chamber from said first and second spring contact chambers having an actuator guide slot defined therethrough extending from said armature chamber to respective ones of said first and second spring contact chambers, an actuator extending through said actuator guide slot, an armature disposed in said armature chamber and engageable with said

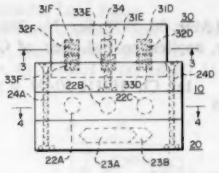
actuator, electric coil means associated with said armature for moving said armature to move said actuator, said housing having a wall bounding an end of said armature chamber with an armature biasing spring retainer slot, and a retainer spring disposed in said armature biasing spring retainer slot and biased against said armature to move it to a return position.

4,101,857

EXTERNALLY-PROGRAMABLE SWITCH

Lawrence P. O'Toole, 80 Steiner Ave., Neptune City, N.J. 07753

Filed Sep. 30, 1976, Ser. No. 724,511
Int. Cl.[2] H01H *9/00*
U.S. Cl. 335—206 **4 Claims**



1. A programable, compound reed-type switch comprising a mounting base; a stationary portion secured beneath said mounting base; said stationary portion comprising at least one layer of reed-type switches positioned in a plane just below said mounting base; a moveable portion rotatably secured above said mounting base; said moveable portion comprising at least one layer of magnet holes forming a first series of magnet holes equispaced about said moveable portion, equidistant from the axis of rotation of said moveable portion, positioned in a plane just above said mounting base; at least one magnet in at least one of said magnet holes of said first series, to pass over and actuate certain of said reed-type switches in a prescribed sequence in the course of its rotation; a detent means for holding said moveable portion in at least one given position with relation to said mounting base and said stationary portion comprising a second series of magnet holes, spaced from said first series of magnet holes, about the periphery of said moveable portion; a third series of magnet holes is said mounting base, positioned to coincide with said second series of magnet holes at given intervals during the rotation of said moveable portion; at least one magnet in one of said second series of magnet holes, with one polarity directed toward said mounting base; and at least one magnet, in one of said third series of magnet holes, with its other polarity directed toward said moveable portion to arrest the motion of said moveable portion in at least one given position of said rotation of said moveable portion.

4,101,858

HIGH TORQUE ROTARY ELECTROMAGNETIC ACTUATOR

William H. Henninger, 702 Bancroft Pl., Paramus, N.J. 07652

Filed Dec. 20, 1976, Ser. No. 752,479
Int. Cl.[2] H01F *7/14*
U.S. Cl. 335—272 **17 Claims**

1. A high torque rotary electromagnetic actuator comprising a generally U-shaped stator having two substantially parallel leg portions joined by a generally transverse connecting portion and defining an axis of symmetry and a pair of spaced stator pole pieces remote from said connecting portion, said stator being formed from a substantially planar sheet of magnetic iron; an elongate core joined at one end to said connecting portion and arranged along said axis; a rotor mounted on the other or free end of said core for rotation about said axis between said pole stator pieces; stop means for limiting rotation of said rotor between a first angular position wherein said rotor is substantially aligned with said stator pole pieces and a second angular position angularly displaced from said first angular position; biassing means for urging said rotor to said second angular position; and a coil coaxially mounted on said core for establishing a magnetic field in the actuator upon energization of said coil to urge said rotor to move from said second to said first angular positions against the action of said biassing means, said rotor being made from a magnetic material and having a predetermined axial thickness and provided with a coaxial counterbore for at least partially receiving said core,

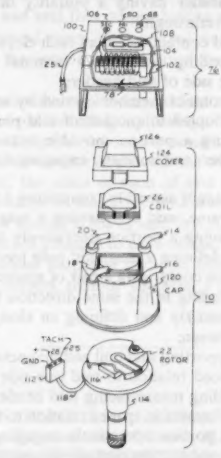
and further being provided with an axial hub portion extending beyond said other or free end of said core, said rotor hub portion being configurated to compensate for the reduced axial thickness of said rotor and provide a path of increased cross-sectional area for the magnetic flux associated with the axial components of the said magnetic field, whereby said axial hub portion and said path increased cross-sectional area decrease the magnetic reluctance in said path and increase the strength of said magnetic field.

4,101,859

MAGNETIC PICK UP FOR USE WITH ELECTRONIC IGNITION SYSTEMS

George I. Reeves, and Jack J. Keegan, both of Fullerton, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 635,742, Nov. 26, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 768,004
Int. Cl.[2] H01F *27/02*
U.S. Cl. 336—90 **2 Claims**



1. Apparatus for coupling an internal combustion engine ignition analyzer to an electronic system of an internal combustion engine, said ignition system having a coil with primary and secondary circuits contained within the distributor producing a quadrature field in a substantially constant position relative to the distributor configuration, the interconnection of said coil secondary circuit and the distributor being generally inaccessible from outside the distributor, the apparatus comprising:

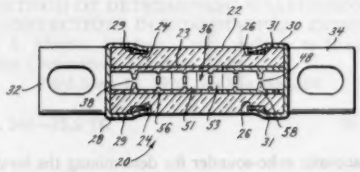
(a) a magnetic core;
(b) a winding on said core adapted to be connected to the analyzer for detecting ignition signals of said ignition system; and,
(c) a housing supporting said core and adapted to be mounted upon the distributor, said housing being configured such that when said housing is mounted upon the distributor said magnetic core is substantially positioned in the quadrature field with respect to the ignition coil of the particular distributor configuration whereby the signal induced by the quadrature field will be maximized and voltages induced by other magnetic fields from the engine will be minimized.

4,101,860

PROTECTOR FOR ELECTRIC CIRCUITS

Aloysius J. Fister, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 20, 1976, Ser. No. 688,552
Int. Cl.² H01H *85/10*
U.S. Cl. 337—159 **15 Claims**



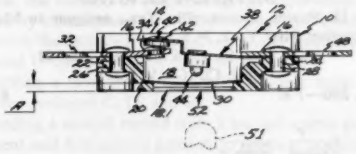
3. An electric fuse as claimed in claim 2 wherein at least one portion of said fusible element engages the surface of said passage to transfer heat from said fusible element to said housing of insulating material, said one portion of said fusible element not being said one or said other weak spot.

4,101,861

THERMOSTATIC SWITCH AND METHOD OF ASSEMBLY

Richard L. Jenne, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 15, 1976, Ser. No. 666,850
Int. Cl.² H01H *37/12, 37/54*
U.S. Cl. 337—368 **9 Claims**



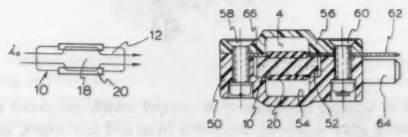
6. A thermostatic switch comprising a base member, an aperture defined by a side wall extending through the base from a first side to an opposed second side, a disc seating shoulder formed in the side wall, a thermostatic bimetallic disc having an outer peripheral margin disposed in the aperture with the outer peripheral margin supported on the disc seating shoulder, a first terminal element supported on the first side of the base extending over the aperture, a second terminal element supported on the first side of the base, a movable contact arm having a first end captured between the second terminal element and the base, the arm extending and terminating over the aperture in a free distal end adapted to move into and out of electrical engagement with a portion of the first terminal extending over the aperture; a motion transfer member disposed within the aperture between the movable contact arm and the disc to transfer motion from the disc to the movable contact arm and to prevent dislocation of the disc from the disc seating shoulder, the movable contact arm having an extended width section over a portion of its length intermediate the first end and the free distal end, the movable contact arm having two approximately right angle bends in the extended width section so that the free distal end of the movable arm lies in a plane spaced from and generally parallel to the remainder of the movable contact arm.

4,101,862

CURRENT LIMITING ELEMENT FOR PREVENTING ELECTRICAL OVERCURRENT

Katsuyuki Takagi, Ichinomiya, and Chihiro Asano, Kakamigahara, both of Japan, assignors to K.K. Tokai Rika Denki Seisakusho, Japan

Filed Nov. 19, 1976, Ser. No. 743,321
Int. Cl.² H01C *7/13, 7/02*
U.S. Cl. 338—23 **14 Claims**



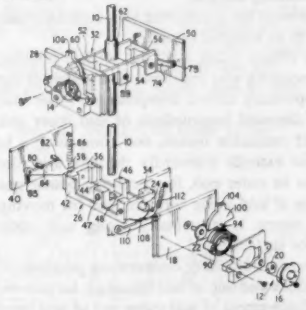
1. A current limiting element for preventing electrical overcurrent comprising:
a generally elongate principle current conductor means of substantially circular cross-section, said conductor means being made from an elastic insulative material having a positive coefficient of thermal expansion mixed with conductive particles; and
a heating/heat insulating member provided about the circumference of said conductor means.

4,101,863

ANGULAR MOVEMENT RESOLVERS

Edward Lewicki, Cheltenham, England, assignor to S.L.M. (Model) Engineers Limited, Cheltenham, England

Filed Dec. 23, 1976, Ser. No. 753,784
Claims priority, application United Kingdom, Apr. 8, 1976, 14227/76
Int. Cl.² H01C *5/00*; G05G *9/02*
U.S. Cl. 338—128 **8 Claims**



1. A control device comprising a pair of pivoting members mounted in a housing for angular movement about mutually orthogonal axes, each pivoting member having a respective coupling member mounted thereon for angular movement relative thereto about an axis perpendicular to the axis of the corresponding pivoting member, and a common member connected to each of said coupling members so as to be restrained against relative translational movement in a plane containing

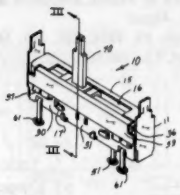
the axis of pivotal movement of the corresponding coupling member, said four axes having a common point of intersection.

4,101,864

VARIABLE RESISTANCE SLIDE CONTROL

John D. Van Benthuysen, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Dec. 30, 1976, Ser. No. 755,850
Int. Cl.² H01C *10/44*
U.S. Cl. 338—183 **14 Claims**



1. A variable resistance slide control which comprises a first housing portion having elongated front and rear edges, having an elongated inner mounting surface that is longitudinally disposed intermediate of said edges, and having front and rear guide surfaces that are longitudinally disposed intermediate of said mounting surface and respective ones of said edges;

second housing portion means, having front and rear walls, having a side wall that is intermediate of said front and rear walls and that includes an elongated inner guide surface that is longitudinally disposed intermediate of said front and rear walls, and having a slot portion in said front wall that cooperates with said front edge of said first housing portion to form an elongated slot that is longitudinally disposed intermediate of said housing portions, for cooperating with said first housing portion to substantially enclose said mounting surface and all of said guide surfaces;

resistance and collector means, being longitudinally disposed proximal to said mounting surface and intermediate of said front and rear guide surfaces and being secured to the mounting surface, for providing longitudinally disposed resistance and collector surfaces that are distal from said mounting surface;

terminal means for connecting said resistance and collector means to an external circuit;

contactor means, being enclosed by said housing, for wipingly engaging said resistance and collector surfaces;

control operating means, comprising a slider block portion that is disposed intermediate of said inner guide surface and said contactor means, and comprising a handle portion that extends outwardly through said slot and that includes an outer end, for receiving planar guiding from all three of said guide surfaces, and for moving said contactor means longitudinally along said resistance and collector surfaces; and

guide means, comprising cooperating portions of both said slider block and one of said housings, for preventing longitudinal movement of said outer end of said handle portion without substantially corresponding longitudinal movement of said slider block;

said first housing portion including a rail that is longitudinally disposed intermediate of one of said edges and said mounting surface and that further including a longitudinally disposed side surface;

said guide means, and said cooperating portions thereof, comprising said side surface.

4,101,865

SONIC ECHO-SOUNDER FOR THE MEASUREMENT OF LEVELS OF SUBSTANCES

Peter Schurr, Maulburg, Fed. Rep. of Germany, assignor to Endress & Hauser GmbH & Co., Maulburg, Fed. Rep. of Germany

Filed Oct. 5, 1976, Ser. No. 729,638
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547759
Int. Cl.² G01S *9/68*; G01F *23/28*
U.S. Cl. 340—1 L **9 Claims**

Fig1

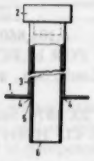


Fig.3a

1. An acoustic echo-sounder for determining the level of a substance in a container or channel, comprising

(a) an acoustic transducer;

(b) an acoustic wave-guided tube having said transducer fitted to one of its ends, the other of its ends being oriented towards the substance the level of which is to be determined;

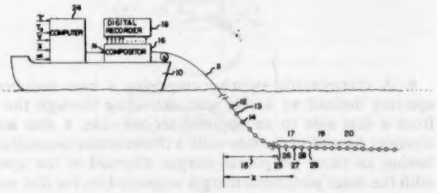
(c) said oter end of said acoustic wave-guided tube being so constructed so that its solid cross-section diminishes progressively towards said other end of the wave-guide tube, whereby the acoustic impedance of the acoustic wave-guide tube is progressively matched to the acoustic impedance of the space containing the substance.

4,101,866

MARINE DETECTOR SPREAD HAVING ARRAYS OF DIFFERENT LENGTHS

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,762
Int. Cl.² G01V *1/38*
U.S. Cl. 340—7 R **4 Claims**



1. A method of seismic exploration utilizing at least one seismic energy source and a linear array of equally spaced seismic detectors, comprising the steps of:

(a) determining the acoustic velocity and dip of the subsurface formations and the seismic reflection times from said formations,

(b) combining the outputs of adjacent detectors in the linear array of equally spaced seismic detectors to form initial

arrays having lengths selected in accordance with said acoustic velocity, dip, and reflection times,

(c) periodically firing the seismic energy source to produce pulses of seismic energy,

(d) detecting the reflected seismic energy with said initial arrays of detectors,

(e) determining the period of said reflected seismic energy,

(f) determining the moveout per unit length along the detectors of said reflected seismic energy, and

(g) changing the lengths of said initial arrays in accordance with the ratio of said period to said moveout per unit length for said reflected seismic energy.

4,101,867

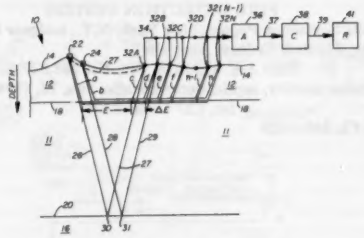
METHOD OF DETERMINING WEATHERING CORRECTIONS IN SEISMIC OPERATIONS

Lincoln A. Martin, Altadena, Calif., assignor to Geophysical Systems Corporation, Pasadena, Calif.

Filed Mar. 12, 1976, Ser. No. 666,360

Int. Cl.[2] G01V *1/36*

U.S. Cl. 340—15.5 TC **20 Claims**



1. In a seismic system having a linear array of source positions A, B, and receiver positions C, D, E, F down line from said source positions, the spacings AB, BC, CD, DE, EF, etc. being equal, the method of determining the differential static corrections by transmission two ways through the weathered layer between the records from adjacent closely-spaced source points A and B, comprising the steps of;

(a) recording a first record from a first source point A to receiver positions C, D, and E;

(b) recording a second record from a second source point B adjacent said first source point A to receiver positions D, E and F;

(c) correlating selected initial short portions of a first trace AC of said first record with the equal initial short portion of the corresponding first trace BD of said second record whereby only refracted seismic waves at the base of weathering are correlated, and reflected waves from deep interfaces are excluded from the correlations;

(d) determining the first timing difference K_1, in travel times through the weathered layer at source points A and B for said first pair of traces AC and BD;

(e) repeating steps (c) and (d) for at least a second pair of corresponding traces, such as AD and BE and determining a second timing difference K_2 in travel times through the weathered layer at source points A and B for said second pair of traces AD and BE; and

(f) determining the average value K_A of all of said plurality of timing differences K_1 and K_2.

4,101,868

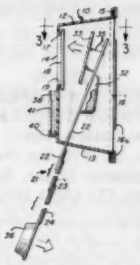
VEHICLE PARKING GUIDE AND SIGNALING DEVICE

Frank J. Bubnich, and Marketta A. Bubnich, both of 3224 Emmaus, Zion, Ill. 60099

Filed Sep. 26, 1977, Ser. No. 836,721

Int. Cl.[2] B60Q *9/00, 11/00, 5/00*

U.S. Cl. 340—51 **6 Claims**



1. A vehicle parking guide and signaling device comprising, a housing section adapted to be supported in a vertical position and having a front wall with an opening therein, said opening being substantially closed by a pane of material through which indicia become visible only when a flat plate having indicia on the front surface thereof is in direct contact with the rear surface of said pane, an actuating means supported by said housing section, said actuating means comprising an upper arm portion movable toward and away from said pane and normally maintained space rearwardly of said pane, a flat plate with warning indicia on the front surface thereof mounted on said upper arm portion and adapted to be moved forwardly into direct contact with the rear surface of said pane when said upper arm portion of said actuating lever is moved into a forwardly operating position, and said actuating means having a lower arm portion adapted to be engaged by a vehicle being parked and effect forward movement of the upper arm portion of said actuating means and move said plate into direct contact with the rear surface of said pane when said vehicle is in a designated parking position; thereby making said warning indicia visible to an observer viewing said pane from within the said vehicle.

4,101,869

VEHICLE WARNING DEVICES

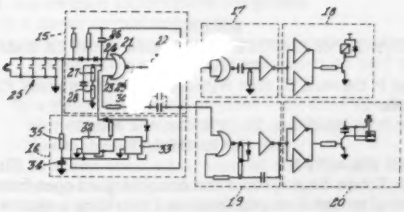
Henning M. Henderson, 21 Marina Vista, Corner Olympia Ave. and 8th St., Parkmore, Sandton, Transvaal Province, South Africa, assignor to Alert-O-Drive (Pty) Ltd., South Africa

Filed Jun. 2, 1976, Ser. No. 691,990

Claims priority, application South Africa, Jun. 4, 1975, 75/3614

Int. Cl.[2] B60Q *9/00;* **G06F** *13/00*

U.S. Cl. 340—52 R **30 Claims**



1. In a device for detecting and recording the occurrence of excessive inertial forces acting on a vehicle, said device having force detecting means actuated when excessive forces are

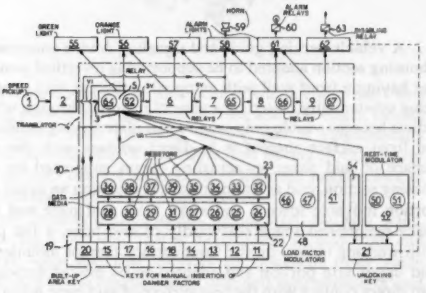
acting on said vehicle, indicator means responsive to said force detecting means for indicating "faults" when said detecting means is actuated, said indicator means including timing means for preventing said indicator means from indicating additional "faults" during a predetermined time interval following the indication of a "fault," the improvement comprising counting means responsive to said indicator means and said detecting means for counting "faults" and for disabling said indicator means from indicating "faults" when the number of "faults" counted during a single actuation of said detector means exceeds a predetermined number.

4,101,870

DEVICE FOR INDICATING SPEED LEVELS FOR MOTOR VEHICLES

Adolphe Ekman, 19 rue Gustave, Delory Lille (Nord), France

Filed Dec. 28, 1976, Ser. No. 755,070
Claims priority, application France, Jan. 21, 1976, 76.02073
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—53 **46 Claims**



15. Device for indicating operational conditions, including speed levels, in a motor vehicle, comprising;

a speed circuit for deriving from a vehicle's speed an electrical signal having a value corresponding to the speed of the vehicle;

means for determining whether danger factors are present and for deriving from each determined danger factor an electrical danger signal of a predetermined value corresponding to the respective danger factor;

means for modulating each derived danger signal in accordance with a safety factor dependent on characteristics of the vehicle and on characteristics of a driver for the vehicle;

means for combining the modulated electrical danger signals with the electrical signal corresponding to the vehicle's speed into a resilient value;

a comparing circuit including a flip-flop relay for comparing the resultant value with a pre-determined threshold; and

a warning system actuatable by the relay upon the comparison, for indicating a danger existing at the danger existing at the detected speed.

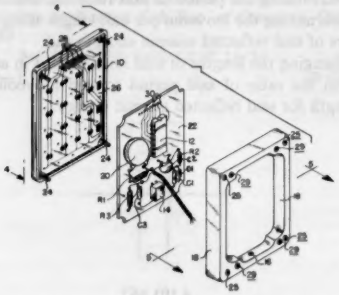
4,101,871

TOUCH-TONE ENCODER UNIT FOR MOBILE RADIO TRANSMITTER

Joseph P. Oliveira, II, 8060 Willoughby Ave., Hollywood, Calif. 90046

Filed Dec. 20, 1976, Ser. No. 752,203
Int. Cl.[2] H04M *1/50*
U.S. Cl. 340—171 R **4 Claims**

1. A Touch-Tone encoder unit comprising: an open frame; a keyboard mounted on said frame and providing a closure for the front thereof; a switching circuit board mounted on said frame adjacent to the rear face of said keyboard in parallel relationship with said keyboard; a plurality of pushbuttons mounted on said keyboard and connected to said switching circuit board; a further circuit board mounted on said frame adjacent to said switching circuit board in parallel relationship therewith, one of said circuit boards having a plurality of connecting pins thereon, and the other of said circuit boards having a plurality of connecting holes therein to establish



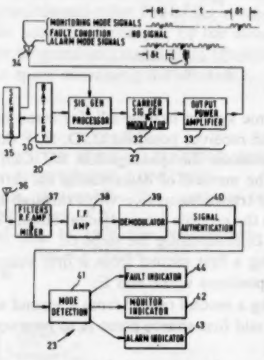
electrical connections between said switching circuit board and said further circuit board; and electrical components and circuitry constituting a Touch-Tone encoder generator circuit mounted on said further circuit board and controlled by said switching circuit board to generate selected dual tones upon the selective operation of said pushbutton switches.

4,101,872

FIRE DETECTION SYSTEM

Dennis Gerasimos Pappas, New York, N.Y., assignor to Aboyne Pty. Limited, Sydney, Australia

Filed Jun. 10, 1975, Ser. No. 585,537
Claims priority, application Australia, Jun. 18, 1974, 7893/74
Int. Cl.[2] G08B *1/08*
U.S. Cl. 340—539 **11 Claims**



1. A wireless information system transmission system comprising at least two radio frequency signal transmitting means and at least one receiving means associated with the tranmsmitting means, each of the signal transmitting means being arranged to transmit in first and second modes, the first mode being a monitoring mode wherein monitoring mode signals which have a duration δt and a repetition rate such that said monitoring mode signals are spaced apart by intervals of time $t >> \delta t$ are employed to modulate a radio frequency carrier signal,

the time interval t between successive monitoring mode signals being allowed to drift randomly between each of the transmitting means,

the second mode being an alarm mode, which is established in response to an alarm inducing condition, wherein alarm

mode signals having the same duration δt as the monitoring mode signals are employed to modulate the carrier signal, the alarm mode signals having a repetition rate greater than the repetition rate of the monitoring mode signals and being spaced apart by time intervals αt,

each said monitoring and alarm mode signal associated with the respective transmitting means being composed of a coded pulse train,

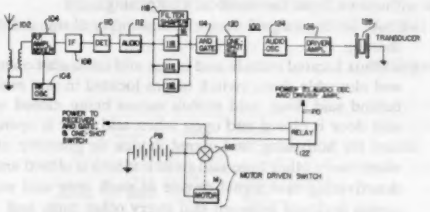
the receiving means being arranged to receive and detect signals from the transmitting means, the receiving means being arranged to provide an output responsive to a change occurring in the mode of transmission by the transmitting means and to provide an output if no signal having the duration δt is detected within each period of successive predetermined fault detecting periods of time $xt > t$, and

the receiving means being arranged to provide an alarm indicating output if at least one signal of duration δt is received and detected within a receiver alarm detection period of time βt, where $\alpha t \leqq \beta t < t$, following receipt of a preceding such signal.

4,101,873
DEVICE TO LOCATE COMMONLY MISPLACED OBJECTS

Benjamin Ernest Anderson, 8313 Aqueduct Rd., Rockville, Md. 20854, and Louise Creegan McIntyre, 2713 Hermitage Dr., Montgomery, Ala. 36111

Filed Jan. 26, 1976, Ser. No. 652,157
Int. Cl.² G08B *1/08*
U.S. Cl. 340—539 **2 Claims**



1. Audible communication means for selectively generating an audible signal at one of a plurality of random positions to be located within a general area comprising:

transmitter means adapted to be utilized by an individual having a plurality of tone generator means selectively interconnected to provide a plurality of transmitted signals corresponding to a respective plurality of random positions;

a plurality of receiver means being attached to corresponding ones of a respective plurality of objects at said random positions, one to locate each of said objects at said random positions, each of said receiver means comprising:

a power source means;

tuning means responsive to only a corresponding one of said transmitted signals and an audio generator means emitting an audible signal in response to said corresponding one of said transmitted signals to audibly identify the location of a corresponding one of said objects at said random positions to said individual;

detector circuit means cyclically energized by said power means and including AND gate means responsive to receipt of a predetermined transmitted signal to provide a control output;

one-shot switch means responsive to said control output to provide a power on signal;

audio generator means for providing an audible output signal; and

wherein said power means comprises:

a battery;

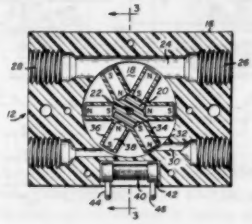
motor driven switch means powered by said battery and cyclically energizing said detector circuit means and said one-shot switch means; and

relay means responsive to said power on signal interconnecting said battery means to said audio generator means to energize the latter to provide said audible output signal.

4,101,874
FLUID FLOW INDICATOR AND FLOW SWITCH

Dean R. Denison, Los Gatos, and George J. Kren, Los Altos, both of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 29, 1976, Ser. No. 709,947
Int. Cl.² G08B *21/00;* **G01F** *1/06*
U.S. Cl. 340—606 **5 Claims**



1. A fluid flow indicator comprising:

a housing having at least one planar surface having a circular aperture therein, the plane of the circle of said aperture being coplanar with said planar surface; said housing containing a plurality of fluid channels entering and exiting said circular aperture, each of said plurality having a different fluid carrying capacity, said channels entering or exiting said circular aperture substantially along a tangent to the periphery of said aperture;

an aperture cover plate having at least one planar surface adapted to cover and seal said circular aperture;

a turbine mounted for rotation within said circular aperture, said turbine having an even number of radially positioned blades, each blade having a bar magnet embedded therein with one pole of said magnet being located adjacent the outer end of said blade, the polarity of said one pole being opposite to the polarity of the magnetic poles in the outer ends of the adjacent blades.

4,101,875
MULTI-SATELLITE INTRUSION ALARM CONTROL SYSTEM

Peter E. Humphries, King, Canada, assignor to Contronic Controls Limited, Mississauga, Canada

Filed Nov. 15, 1976, Ser. No. 742,047
Int. Cl.² G08B *13/16, 25/00, 27/00*
U.S. Cl. 340—504 **9 Claims**

1. An intrusion alarm system comprising:

(1) a master control unit having:

(a) two power supply terminals, and power supply means coupled thereto for supplying power to said power supply terminals,

(b) a master drive signal terminal, and a drive signal generator coupled thereto for applying a drive signal to said master drive signal terminal,

(c) a master alarm signal terminal, and a detector coupled thereto and responsive to receipt of a predetermined high level first alarm signal thereat for generating a second alarm signal,

(2) a plurality of satellite units, each having:

(a) a satellite drive signal terminal, and a transmitter coupled thereto and responsive to receipt of said drive

signal thereat for transmitting a radiation field in a supervised area,

(b) a receiver for receiving a portion of said radiation field which is reflected from objects in said area,

(c) signal processing means coupled to said receiver for comparing the transmitted and received fields and responsive to disturbances in said received field caused by a moving intruder in the supervised area, for generating a third alarm signal upon occurence of such disturbance,

(d) a satellite alarm signal terminal,

(e) a control circuit coupled to said signal processing means and to said satellite alarm signal terminal and responsive to receipt of said third alarm signal for generating said high level first alarm signal at said satellite alarm signal terminal,

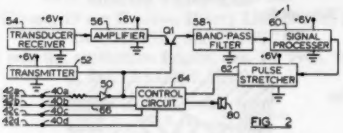


FIG. 2

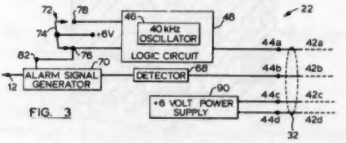


FIG. 3

(f) two satellite power receiving terminals for receiving power and coupled to said transmitter, to said receiver, said signal processing means, and to said control circuit for supplying power thereto,

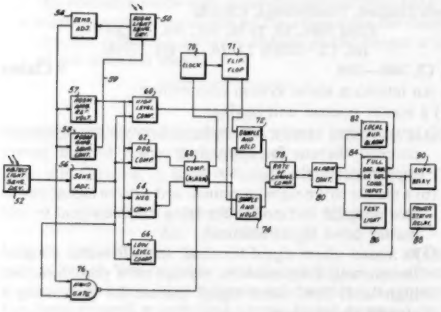
(3) a cable having only four wires connecting each satellite unit to said master control unit, two of said wires being connected between said power supply terminals and said satellite power receiving terminals, a third of said wires being connected between said master drive signal terminal and said satellite drive signal terminal, and the fourth of said wires being connected to said master alarm signal terminal and said satellite alarm signal terminal.

4,101,876

PHOTO ELECTRIC SECURITY SYSTEM

Alexander Lurkis, Holliswood, and John I. Hill, Ronkonkoma, both of N.Y., assignors to Glimmer Security Systems Inc., Floral Park, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,785
Int. Cl.[2] G08B *13/18*
U.S. Cl. 340—555 **6 Claims**



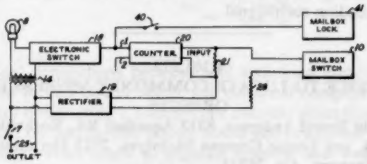
1. A security arrangement comprising an area having ambient radiation therein, an article requiring security monitoring in said area, a radiation sensor in said area for the formation of an electrical signal, sad article being located adjacent said sensor in intercepting relationship with said ambient radiation, and alarm means coupled to said sensor for responding to said electrical signal, said area including a wall and said article being mounted on said wall with the sensor being located between the article and wall, said arrangement further comprising means coupling said sensor to said alarm means and including a wire supporting said article on said wall and constituting at least part of the coupling between the sensor and alarm means.

4,101,877

MAIL DELIVERY ALARM SYSTEM

Donald W. Rush, 633 Myrtle Rd., North Brunswick, N.J. 08902

Filed Jun. 11, 1976, Ser. No. 695,506
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—569 **1 Claim**



1. A system for activating at least one signal device located in a house when mail is deposited in a mailbox located outside the house and for deactivating the signal device when the mail is withdrawn from the mailbox, comprising:

a house having a signal device or a plurality of signal devices therein;

a mailbox located outside said house and having an openable and closeable door, switch means located in said mailbox behind said door, said switch means being closed when said door is closed and open when said door is open;

means for activating said signal device or plurality of devices every other time said switch means is closed and for deactivating said signal device at each time said switch means is closed between said every other time; and

an electrically engagable lock means located in said mailbox for locking the mailbox door shut, said lock being engaged at said every other time said switch means is closed, and manually operated switch means for disengaging said lock means.

4,101,878

SELF-CUT-OFF POWER SWITCH FOR A REMOTE CONTROLLED ELECTRONIC EQUIPMENT

Keizo Shimizu; Takeshi Maruyama, both of Yokohama, and Toshio Fujimura, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1976, Ser. No. 729,263
Claims priority, application Japan, Oct. 6, 1975, 50-119731
Int. Cl.[2] H04M *11/04*
U.S. Cl. 340—310 R **7 Claims**

1. A power switch for a remote controlled electronic equipment comprising;

A. a switch element having on and off states,

B. a control unit for controlling turn-on and turn-off of said switch element,

C. a remote controlled load circuit,

D. a power supply,

E. a means for supplying a power from said power supply to said load circuit through said switch element,

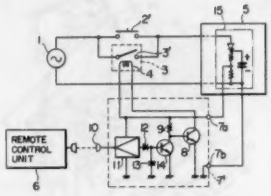
F. a means for supplying a power from said power supply to said control unit through said switch element,

G. a remote control unit for generating a stop signal to turn off said switch element from its onstate, and

H. a manual means for shortcircuiting said switch element when a manual operation is intervened,

said control unit including;

a. a holding means which is operable only when the power is being fed to said control unit to turn on said switch element and which turns off said switch element during its non-operable condition, and



b. a stop means which is operable only when the power is being fed to said control unit to maintain said holding means in its operating condition until the stop signal is received and which switches said holding means to its non-operating condition when the stop signal is received.

4,101,879

CURSOR MOVEMENT CONTROL DEVICE FOR SCREEN-SEGMENTED DISPLAY APPARATUSES

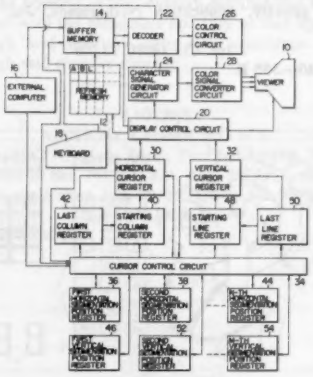
Mitsuo Kawaji; Toshio Usui, and Masaichiro Kawano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 13, 1976, Ser. No. 749,973

Claims priority, application Japan, Dec. 26, 1975, 50-156413

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **6 Claims**



1. A cursor movement control device for a screen-segmented display apparatus, comprising at least one segmentation position register for storing a segmentation position of a display screen, a starting position register for storing the starting position of cursor display in each section, a last position register for storing the last position of cursor display in said section, a cursor register for storing the cursor position on display, and cursor control means for altering the data in said registers in response to a command from an external source, said cursor control means including means for causing said cursor register to store the data of said starting position register when the data in said cursor register coincides with that in said last position register and means responsive to completion of cursor movement required in one section for storing the starting position of another section associated with the next cursor display in said starting position register while at the same time storing the last position of said section associated with said next cursor display in said last position register.

4,101,880

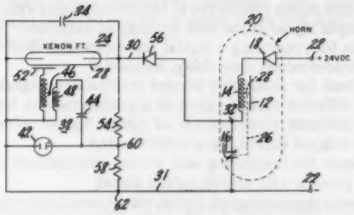
AUDIOVISUAL SIGNALING DEVICE

Rein Haus, Long Branch, N.J., assignor to Wheelock Signals, Inc., Long Branch, N.J.

Filed Dec. 27, 1976, Ser. No. 754,740

Int. Cl.[2] G08B *7/00*

U.S. Cl. 340—326 **11 Claims**



1. An audiovisual signaling device comprising auditory signaling means, induction means for energizing said signaling means, circuit-interruption means in series circuit with said induction means, and flashtube means electrically connected to said induction means and interruption means, said induction means acting as an electromagnet when a voltage is impressed across said induction means and interruption means, said series circuit being intermittently interrupted by said interruption means, and said flashtube means being actuated in response to the decaying magnetic field of said induction means when said circuit is thus interrupted.

4,101,881

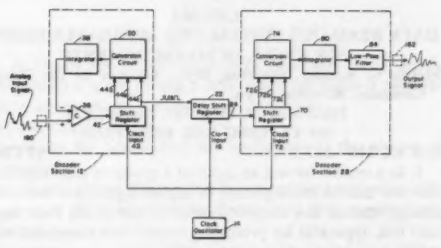
MULTIPLE STATE RESPONSIVE DELTA-SIGMA CONVERTER AND DELAY LINE

Richard E. De Freitas, Westford, Mass., assignor to Hybrid Systems Corporation, Bedford, Mass.

Filed Mar. 15, 1976, Ser. No. 667,146

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 R **8 Claims**



1. A delay line for producing a delay in an analog input signal comprising:

comparator means for producing a digital output signal indicative of the level of the analog input signal with respect to a variable reference signal level;

means for storing the digital values of said digital output signal at a plurality of successive time periods;

conversion means for producing the reference signal as a function of a plurality of said stored digital values at said plurality of sequential time periods such that the reference signal is varied in a direction which lessens the difference

between it and the analog input signal applied to said comparator means;

said conversion means including:

means for producing an intermediate signal as a predetermined function of said plurality of stored digital values; and

an active integrator circuit providing true integration for integrating said intermediate signal to produce said variable reference signal such that the rate of change of said variable reference signal with respect to time is proportional to the amplitude of the intermediate signal throughout the dynamic range of said variable reference signal; and

decoder means responsive to the stored digital values of said output signal at the said plurality of successive time periods for producing a digital representation thereof after a predetermined time delay, including:

means for producing second intermediate signals having different analog values as a predetermined function of different combinations of plural digital values in the delayed digital representation; and

means for integrating said second intermediate signals to provide said analog output signal;

wherein the number of digital values used in providing said intermediate signals is three;

wherein the predetermined function for producing the first and second intermediate signals produces intermediate signals of a first polarity in response to digital values of **000**, **001**, **010**, and **011**, and produces intermediate signals of the opposite polarity in response to digital values of **100**, **101**, **110**, and **111**;

wherein the intermediate signals of the first polarity are further produced such that: in response to a digital value of **000**, the intermediate signal has a first magnitude; in response to a digital value of **001**, the intermediate signal has a second magnitude less than the first magnitude; in response to a digital value of **010**, the intermediate signal has a third magnitude less than the second magnitude; and in response to a digital value of **011**, the intermediate signal has a fourth magnitude intermediate the first and third magnitudes; all of said previous four intermediate signals being of the first polarity; and

wherein the intermediate signals of the opposite polarity are produced so that in response to digital values of **111**, **110**, **101**, and **100**, the magnitudes of the intermediate signal are substantially equal to said first, second, third and fourth values, respectively, all of said second four intermediate signals being of the opposite polarity.

4,101,882

DATA READ-OUT SYSTEM AND APPARATUS USEFUL FOR ANGULAR MEASUREMENTS

Melvin G. Kramer, Riverton, Wyo., assignor to The Brunton Company, Riverton, Wyo.

Filed May 28, 1976, Ser. No. 691,078

Int. Cl.[2] G08C *9/06;* **H03K** *13/18*

U.S. Cl. 340—347 P **19 Claims**

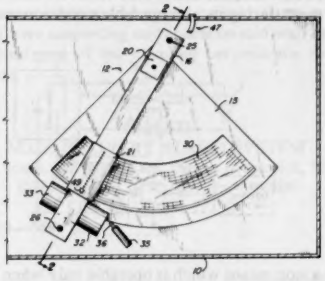
1. In a system having an input of a group of least significant bits and one or more groups of higher significant bits which change state at one transition point of one of the least significant bits, apparatus for producing output date correlated to the system input free of transition ambiguities comprising:

system output means;

means for coupling information correlated to the least significant bits to said system output means;

means for storing information correlated to the higher significant bits and for transferring said stored information to said system output means;

control circuit means responsive to the status of the least significant bits for controlling the information input into said storage means, said control circuit means generating a control signal in the presence of a first zone around the transition point and a transition reflecting signal in the presence of the transition point, said control circuit generating a load signal in the presence of a second zone removed from said first zone, said load signal operative to input higher significant bit correlated information into said storage means; and



commutation circuit means associated with said control circuit means and responsive to said control signal for disabling said storage means from receiving said higher significant bit correlated information and responsive to said transition reflecting signal for altering the information in said storage means.

4,101,883

KEYBOARD

Klaas Hempenius; Jan Cornelis Van Mourik, and Petrus Franciscus Stevens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

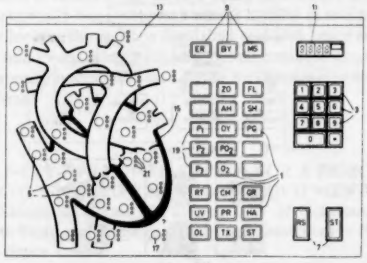
Continuation of Ser. No. 590,438, Jun. 26, 1975, abandoned.

This application Apr. 20, 1977, Ser. No. 789,212

Claims priority, application Netherlands, Jul. 15, 1974, 7409515

Int. Cl.[2] G08C *11/00*

U.S. Cl. 340—365 R **2 Claims**



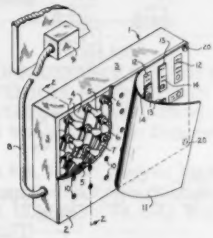
1. In computerized medical apparatus for diagnosing a physiological system said apparatus having on a keyboard a plurality of location command keys for operator communication to the apparatus of the location in the physiological system of an input element making a physiological measurement, improved means for identifying to the operator the physiological location associated with each of the location command keys, said improvement comprising: a diagramatic image representation of the physiological system on the keyboard background, the image representation including at least that portion of the physiological system at which input physiological measurements might be taken, each of the location command keys being physically located at the position on the image representation corresponding to the location in the physiological system communicated to the apparatus by actuation of that key.

4,101,884

VISUAL DISPLAY WITH MAGNETIC OVERLAY

Lawrence M. Benton, Jr., 1727 N. 34th St., Milwaukee, Wis. 53208

Filed Feb. 3, 1977, Ser. No. 765,354
Int. Cl.[2] G09F 7/04
U.S. Cl. 340—366 B 6 Claims



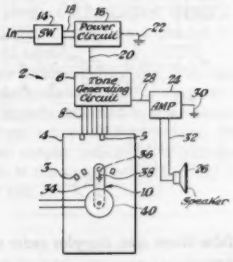
1. A visual display device comprising, in combination:
(a) a planular support wall having a plurality of apertures therein,
(b) a light source disposed behind said support wall,
(c) a removable flexible light transmissive imperforate membrane disposed on the front of said support wall, and with said membrane having a plurality of discrete spaced display indicia portions thereon,
(d) said indicia portions being disposed over said apertures,
(e) at least one planular overlay member adapted to be removably disposed over one of said indicia portions and with said overlay member having a revised indicia thereon different from said first-named indicia,
(f) means for securing said overlay member in place so that said membrane is confined between said overlay member and said support wall,
(g) and an opening in said overlay member and adapted to register with the respective aperture so that light passing through said aperture onto said membrane is visible through said overlay member.

4,101,885

MUSICAL CHIME DEVICE

Emil Blum, 4143 N. Ocean Blvd., Fort Lauderdale, Fla. 33308

Continuation of Ser. No. 607,834, Aug. 26, 1975, abandoned.
This application Jun. 20, 1977, Ser. No. 807,922
Int. Cl.[2] G08B 3/00
U.S. Cl. 340—384 E 4 Claims



1. A replaceable electric melody circuit board record for engagement with an electronic oscillator tone generating means for automatic play of a melody when continuously sweeped by electrical connecting means comprising:
a removable printed circuit board with a playing surface,
sequential and variable sized electrically conductive areas of melody control area means on said playing surface to provide a melody in conjunction with an electronic oscillator tone generating means,
said melody control area means sized to provide the time length of each tone when sweeped by connecting means,
said melody control area means spaced apart to provide the time length of the pause between each note, and
said melody control area means oriented in a single path pattern from start to finish for providing a complete melody,
the edge of said melody circuit board including connector means interconnected with said melody control area means for sequentially picking up the proper tone when connected to an electronic oscillator tone generating means to provide various melodies from different printed circuit boards.

4,101,886

APPARATUS FOR CONSERVING ENERGY IN ELECTRICAL APPLIANCES

Johnny C. Grimes, 873 Grand Cir., Las Vegas, Nev. 89101; Richard L. Pierce, 6641 Sambar Cir., Cypress, Calif. 90630; Jimmy R. Payne, 3584 S. Bronco Rd., Las Vegas, Nev. 89102, and Nate Schlaifer, 1314 Sweeney Ave., Las Vegas, Nev. 89104

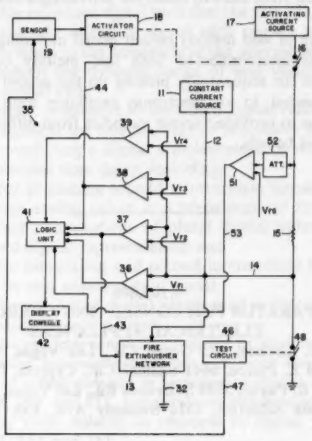
Filed May 16, 1977, Ser. No. 797,382
Int. Cl.[2] G08B 1/00
U.S. Cl. 165—14 10 Claims

1. A device for conserving energy consumption by appliances within a room having a door when the room is unoccupied by an occupant, which device comprises:
(a) a source of energy;
(b) means for connecting the appliances to the source of energy;
(c) control means for causing the connecting means to connect or disconnect the appliances and the source of energy;
(d) sensing means responsive to the ingress to and egress from the room by the occupant, which sensing means includes:
1. first switch means responsive to activation by the occupant, and
2. second switch means responsive to the opening and closing of the door; and
(e) transmitting means activated and inhibited by the sensing means for transmitting control signals to the control means, thereby causing the appliances to be connected to or disconnected from the source of energy responsive to the ingress to or egress from the room by the occupant.

4,101,887
MONITORED FIRE PROTECTION SYSTEM

William B. Osborne, Marlboro, Mass., assignor to Walter Kidde and Co., Inc., Clifton, N.J.

Filed Sep. 24, 1976, Ser. No. 726,209
Int. Cl.[2] G05B *23/00*
U.S. Cl. 340—652 15 Claims



1. An electrical protection system comprising:

a plurality of suppressor units activatable to suppress an abnormal condition;

a plurality of electrical current responsive activators, one associated with each of said suppressor units and adapted to induce activation thereof;

an activator current supply means;

activator control circuit means comprising series circuit means connecting said activators in series, a sensor means for said abnormal condition, and initiator means responsive to said sensor means for initiating activating current flow from said activator supply means to said series connected activators so as to induce activation of said suppressor units;

a supervisory current supply means providing through said series connected activators a constant level of supervisory current flow insufficient to induce activation of said suppressor units;

fault voltage responsive means for detecting a given abnormally high voltage level across said series connected activators; and

switching circuit means for connecting said activators in parallel in response to detection of said abnormally high voltage across said series connected activators.

4,101,888
ANTICOLLISION CAR RADAR

Hans-Dieter Heller, Nurtingen; Wolfram Hertler, Kornwestheim, and Karl Petschauer, Karlsruhe, all of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

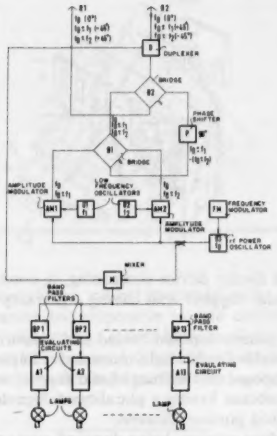
Filed Nov. 17, 1976, Ser. No. 742,406
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553302
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—7 VM 1 Claim

1. An anticollision radar for motor vehicles comprising:

at least two antennas each radiating a radio frequency signal of different frequencies, said two antennas having overlapping radiation patterns;

a first means coupled to said two antennas to amplitude modulate a single radio frequency signal with two low frequencies to generate said radio frequency signals of different frequencies.

second means coupled to one of said two antennas to receive said radio frequency signals of different frequencies reflected from an object, to determine the difference between the amplitudes of said two radio frequency signals



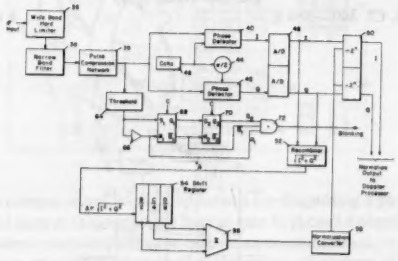
reflected from said object and to generate a direct current voltage proportional to said difference; and

third means having a threshold determined by a predetermined azimuth range coupled to said second means, said third means being responsive to said voltage to indicate whether said object is in the same road lane as a motor vehicle equipped with said radar.

4,101,889
CONSTANT FALSE ALARM RATE DOPPLER RADAR SYSTEM

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 20, 1975, Ser. No. 588,576
Int. Cl.[2] G01S *9/42*
U.S. Cl. 343—7.7 18 Claims



1. A constant false alarm rate, doppler radar system comprising in combination:

a recombining network responsive to both in-phase and quadrature signal outputs from analog-to-digital converters and forming therefrom an output signal functionally related to said in-phase and quadrature signals;

a shift register responsive to output signal from the recombining network and forming functionally related output signals therefrom;

a summing circuit responsive to output signals developed in

the shift register and forming a functionally related output signal therefrom:

a normalization converter responsive to output signal from said summing circuit and furnishing output signal functionally related thereto;

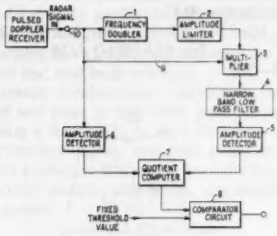
a divide-by-2^N circuit responsive to output signals from the normalization converter and the analog-to-digital converters and furnishing in-phase and quadrature signals to a doppler processor.

4,101,890

RADAR RECONNAISSANCE SYSTEM FOR TRACK VEHICLE RECOGNITION

Pierre Jean-Marie Goyard, Fontenay le Fleury, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 766,935
Claims priority, application France, Mar. 10, 1976, 76 03563
Int. Cl.[2] G01S *9/44, 9/42, 9/02*
U.S. Cl. 343—8 **5 Claims**



1. In a pulsed Doppler radar system providing at least one received signal corresponding to a discrete range bin, the combination comprising:

first means responsive to said received signal to provide a second signal the components of which are of doubled frequency as compared to said received signal;

multiplier means responsive to said received signal and to said second signal to provide a third signal which is the product of said received and second signals;

filter means responsive to said third signal to produce a fourth signal which contains substantially only those spectral components corresponding to the tracks of a track vehicle;

first and second amplitude detectors responsive to said received and said fourth signal, respectively, to provide demodulated received and fourth signals;

second means responsive to the outputs of said amplitude detectors to produce a fifth signal which is the quotient of said demodulated fourth signal divided by said demodulated received signal;

and third means for comparing said fifth signal with a fixed threshold representative of the average ratio of the amplitudes of the signals reflected by the vehicle body to those refelected from a track of said vehicle, said third means providing an output indicative of the presence of said track vehicle at the range corresponding to said received signal range bin.

4,101,891

SURFACE ROUGHNESS MEASURING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Atul Jain, Altadena, Calif.

Filed Nov. 24, 1976, Ser. No. 744,577
Int. Cl.[2] G01S *9/02, 9/60*
U.S. Cl. 343—17.2 PC **5 Claims**

1. Apparatus for determining heights of ocean waves or terrain peaks utilizing synthetic-aperture radar to attain a return signal from said waves or peaks, said signal having a spectrum of bandwidth f_r, comprising

means for compressing said radar signal over different bandwidths, Δf_r, of said spectrum to obtain a plurality of intensity images $I_1(x)$, $I_2(x)$, . . . $I_n(x)$, said bandwidths being centered at frequencies $f_{r01}, f_{r02}, \ldots f_{r0n}$, each spaced by a frequency difference of Δf_{r0} from the first f_{r01}, and

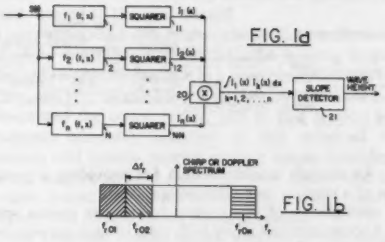


FIG. 1a

FIG. 1b

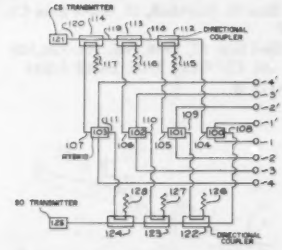
means for cross-correlating a selected area of one of said images with a corresponding area of at least one of the other of said images to determine a cross-correlation function value $R^E(\Delta f_{r0})$ for a given spacing Δf_{r0} which is a function of height of said waves or peaks.

4,101,892

LOCALIZER ANTENNA ARRAY FOR USE WITH LOCALIZER TRANSMITTERS OPERATING AT ONE CARRIER FREQUENCY

Andrew Alford, 71 Bacon St., Winchester, Mass. 01890

Filed Nov. 19, 1975, Ser. No. 633,457
Int. Cl.[2] G01S *1/16*
U.S. Cl. 343—108 R **12 Claims**



1. A localizer antenna array comprising:

(a) an even number of antenna elements,

(b) a transmitter of the carrier and sidebands,

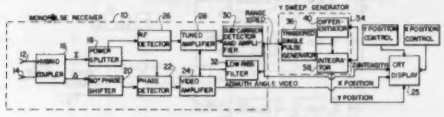
(c) power supplied by said transmitter to a group of power dividers,

(d) a group of hybrids fed by said power dividers distributing the carrier and sidebands power among the antenna elements substantially in accordance with a geometrical progression.

4,101,893
AIRCRAFT LANDING AID FOR ZERO-ZERO VISIBILITY LANDINGS

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1977, Ser. No. 822,175
Int. Cl.[2] G01S *1/16*
U.S. Cl. 343—108 R **7 Claims**



1. An aircraft landing system for providing a perspective view of a runway to a pilot comprising:

a multiplicity of microwave transmitter means spaced at known intervals along both sides of said runway for transmitting pulses;

timing generator means for producing sequential signals which cause said microwave transmitters to transmit in sequence, the time spacing between each signal being related to the distance between the microwave transmitter to be triggered and the previous sequential microwave transmitter;

monopulse receiver means including a pair of spaced antennas mounted in a horizontal plane for receiving said transmitted pulses and for generating a range video signal and azimuth angle video signal for each pulse;

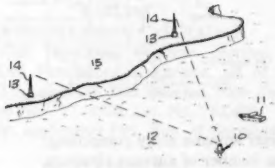
Y-sweep generator means for generating a sweep voltage in response to the sum video signal for the first transmitted pulse, said sweep voltage having a time length at least as long as the time required to receive all transmitted pulses;

CRT display means having X- and Y-position inputs and a Z intensity input, said X position input receiving said azimuth angle video signal for each received pulse to display the azimuth angle on the X axis for each microwave transmitter, said Y position input receiving said sweep voltage for generating a Y sweep of sufficient length to display all transmitted pulses in a sequence, and said Z position input receiving said sum signal to intensity-modulate said CRT display.

4,101,894
RADIO BEACON FOR A NAUTICAL EMERGENCY RESCUE SYSTEM

Melvin B. "Cy" Warner, 12144 Blix St., Los Angeles, Calif. 90068, and Dan H. Marshall, II, 873 Pecan Ct., Sunnyvale, Calif. 94087

Filed Sep. 17, 1976, Ser. No. 724,348
Int. Cl.[2] G01S *5/04;* H04B *1/034*
U.S. Cl. 343—112 R **20 Claims**



17. A nautical emergency rescue system comprising;

a plurality of beacons each having an antenna, a ground plane, a transmitter connected to said antenna and ground plane, and a modulator for said transmitter all contained in a flotation case,

said modulator providing frequency modulation of said transmitter with a repetitive, selectable pattern including a component at audio frequency, the pattern of each beacon being uniquely different from the pattern of the other beacons,

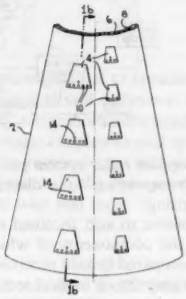
a duty cycle control circuit for said beacon, contained within said case, for alternately turning on said transmitter for a time duration sufficient to permit detection and direction finding of said beacon and for turning off said transmitter for a time duration sufficient to permit detection and direction find of other like beacons operating on the same frequency, and

a direction-finding receiver system for detecting and finding the direction of plural such beacons, the unique modulation pattern facilitating identification of each detected beacon.

4,101,895
MULTIFREQUENCY ANTENNA SYSTEM INTEGRATED INTO A RADOME

Howard S. Jones, Jr., Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 14, 1977, Ser. No. 768,126
Int. Cl.[2] H01Q *1/28*
U.S. Cl. 343—708 **9 Claims**



1. A multifrequency antenna system for integration into dielectric structures comprising:

A body whose structure is composed of a dielectric material;

Conductive plating on the inside surface of the body;

A plurality of conductive patches on the outside of the body forming one antenna array;

A second plurality of conductive patches on the outside of the body forming a second antenna array, wherein the first and second plurality of patches are wedge shaped and are each linearly aligned;

A means for shorting the bottom edge of the first and second plurality of conductive patches to the inside conductively plated surface; and

Coupling means for energizing the arrays whereby an efficient multifrequency antenna is constructed with a minimum of cross polarized components and coupling between the arrays.

4,101,896
CAMOUFLAGED DUAL-SLOT ANTENNA

Kurt Ikrath, deceased, late of Elberon, N.J. (by Gertrude Ikrath, executrix); Paul Sexton, Eatontown, N.J.; Peter Pingitore, Wayside, N.J., and William Kennebeck, Highlands, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,412
Int. Cl.[2] H01Q *1/32, 1/38, 9/00, 1/50*
U.S. Cl. 343—713 **5 Claims**

1. In combination with a vehicle having at least one body

portion which is generally vertical and curved in its horizontal projection;

a source of a radio frequency signal; and

an antenna connected to said source of said radio frequency signal, said antenna being characterized by:

a metal plate which is generally vertical curved along the horizontal axis to at least partially conform to the curvative of said body portion, so that the plate has upper and lower edges;

nonconducting spacing means to maintain said plate spaced

from and generally parallel to said body portion, to define a first slot between the upper edge of said plate and said body portion, and a second slot between the lower edge of said plate and said body portion;

shorting means conductively connecting two grounding points of said plate to said body portion, and feed means connecting a feed point on said plate to said source of a radio frequency signal, said feed point being vertically spaced by a substantial distance from the line between said two ground points and being intermediate said two ground points.

4,101,897

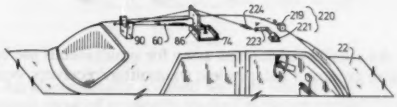
C.B. RADIO ANTENNA UNIT SYSTEM AND PROCESS

Gary Eugene Morrison, Pampa, Tex., assignor to John M. Goldesberry, Houston, Tex., a part interest

Filed Sep. 7, 1976, Ser. No. 720,977

Int. Cl.[2] H01Q 1/32

U.S. Cl. 343—715 **5 Claims**



1. In the combination of a vehicle and a radio frequency communication means in said vehicle and an antenna connected thereto, said antenna on said vehicle, the improvement which comprises a rigid dimensionally stable antenna unit, a pivotal antenna unit support means, a dimensionally stable tension bearing support and an overload release means in operative combination;

(a) said rigid dimensionally stable antenna unit comprising a vertical rectilinear electrically conductive antenna element and a co-axially extending loading coil operatively connected thereto and having a physical height in range of 36 to 72 inches and an electrical characteristic of resonating as a ¼ wave length antenna to a radio broadcast wave length in the 11 meter band of class D citizens band frequencies, and cable connecting means connected to said coil, and

a rigid non-magnetic electrically non-conductive shell firmly attached to and surrounding said electrically conductive antenna element and loading coil, forming a rigid dimensionally stable support for said electrically conductive antenna element,

said shell extending from the bottom of said antenna unit for the major portion of said antenna unit, the rigidity of said antenna unit being such that said unit does not deflect at its top more than one inch in six feet of length in an air stream passing transverse thereto having a velocity of 40 miles per hour,

(b) said pivotal antenna unit support means comprising a rigid plate firmly attached to the bottom of said antenna unit support on said vehicle, a pivotal connection between said rigid plate and said antenna unit support on said vehicle, said pivotal connection extending along an axis transverse to said electrically conductive antenna element and located to the rear thereof;

(c) one, upper, end of a non-magnetic electrically non-conductive dimensionally stable tension bearing support attached to the antenna unit at a portion of the shell thereof near the top of said electrically conductive antenna element and the other, lower, end of said tension bearing support releasably attached to said overload release means, said tension bearing support means extending forward and downward from said one, upper, end to said other, lower, end and latch engaging means at said other, lower, end of said tension bearing means;

(d) said overload release means attached to said vehicle in front of said antenna unit support on said vehicle and comprising a latch means and a latch means support; said latch means support firmly attached to said vehicle and said latch means movably supported on said latch means support,

said latch means being movable between (i) one position wherein it engages said latch engaging means while said rectilinear electrically conductive element is vertical and (ii) another position wherein said latch means does not engage said latch engaging means while said rectilinear electrically conductive element is in a nonvertical position spring means attached to said latch means and holding said latch means into engagement with said latch engagement means when said latch means is at said position wherein it engages said latch engaging means.

4,101,898

BASE FED, TOP-LOADED VERTICAL WHIP ANTENNA

David Lee Ingram, E. 7316 Boone, Spokane, Wash. 99206

Filed Jul. 26, 1976, Ser. No. 709,007

Int. Cl.[2] H01Q 9/16

U.S. Cl. 343—752 **6 Claims**

1. A base fed, top-loaded vertical whip antenna which is adapted to be connected to a radio frequency transmission line, comprising:

a vertical, elongated electrically non-conductive support core extending from a base end portion to an upper end portion with an intermediate central portion;

means for mounting the base end of the support core to a support with the upper end portion being freely unsupported;

an elongated electrically conductive wire having a dielectric coating thereon;

said electrically conductive wire having a lead section for operatively connecting to the radio frequency transmission line at the base end portion and extending from the base end portion along the central portion of the core to the upper portion of the core terminating in a closed, tightly-wound helical loading coil section wrapped about the upper end portion of the core;

said closed wound helical coil section having an upper main coil component with a majority of the closed, wound coil turns and a lower secondary coil component having a minority of the closed wound coil turns;

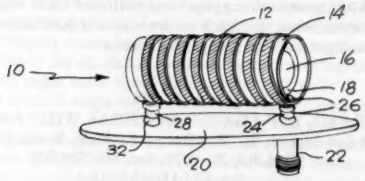
said secondary coil component being spaced immediately vertically below the main coil component a distance of between 0.187 and 0.313 inches with the secondary coil segment being electrically connected in series with the lead section and the main coil component and electromagnetically coupled to the main coil component.

4,101,899

COMPACT LOW-PROFILE ELECTRICALLY SMALL VHF ANTENNA

Howard S. Jones, Jr., Washington, D.C., and Frank Reggia, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1976, Ser. No. 748,587
Int. Cl.[2] H01E *7/08*
U.S. Cl. 343—788 **7 Claims**



1. A compact low-profile electrically small antenna, which comprises:

a substantially cylindrical substrate, wherein said cylindrical substrate comprises a tubular member composed of a dielectric material;

multi-turn conductor means coiled about said cylindrical substrate, wherein said multi-turn conductor means comprises a conducting ribbon copperplated about the outer surface of said cylindrical substrate;

a ground plane over which said cylindrical substrate is mounted;

ferrite means for loading and tuning said multi-turn conductor means, wherein said ferrite means comprises a ferrite rod positioned coaxially within said tubular member; and

a tubular rod sleeve of a dielectric material means surrounding said ferrite rod for supporting same within said tubular member.

4,101,900

MODIFIED T-BAR FED SLOT ANTENNA

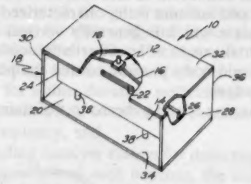
Michael R. Crews, Charlotte, N.C., and Gary A. Thiele, Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1977, Ser. No. 772,808
Int. Cl.[2] H01Q *1/28*
U.S. Cl. 343—789 **4 Claims**

1. A T-bar fed slot antenna comprising:

a rectangular waveguide segment forming a cavity; and

a planar cross section T-bar having one side gradually sloping from its midpoint to its endpoints, said T-bar includes a slot centered between its ends said slot being generally



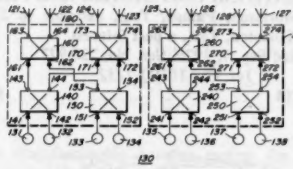
parallel to a line joining said endpoints, the length of said slot is substantially one-half the wavelength of the upper endpoint of the frequency range.

4,101,901

INTERLEAVED ANTENNA ARRAY FOR USE IN A MULTIPLE INPUT ANTENNA SYSTEM

Richard Stephen Kommrusch, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1975, Ser. No. 642,829
Int. Cl.[2] H01Q *21/06*
U.S. Cl. 343—853 **11 Claims**



1. An interleaved antenna array for simultaneous use by two or more groups of independent transmitter/receivers, comprising:

a first plurality of antenna element means for generating a first composite radiation pattern for at least any one of a first plurality of independent electrical devices for processing radio frequency signals;

first coupling means for coupling each of said first plurality of devices to every one of said first pluraity antenna element means;

a second plurality of antenna element means for simultaneously and independently generating a second composite radiation pattern for at least any one of a second plurality of independent electrical devices for processing radio frequency signals, said first and second pluralities of said antenna element means being independently operative; and

second coupling means, totally independent from said first coupling means, for coupling each of said second plurality of devices to every one of said second plurality antenna element means;

each antenna element means of said first plurality of antenna element means being disposed about a central axis and constructed for independently generating an associated radiation pattern directed substantially away from said central axis and each of said antenna element means of said second plurality of antenna element means; and

each antenna element means of said second plurality of

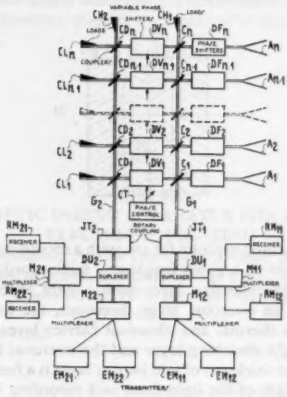
antenna element means being alternately disposed circumferentially about said central axis with each of said first plurality antenna element means, and each of said second plurality antenna element means constructed for independently generating an associated radiation pattern directed substantially away from said central axis and each of said antenna element means of said first plurality of antenna element means, and

wherein said first coupling means includes first circuitry for providing a 90° electrical phase shift between the associated radiation patterns created by adjacent antenna element means in said first plurality of antenna element means and said second coupling means includes second circuitry for providing a 90° electrical phase shift between the associated radiation patterns created by adjacent antenna element means in said second plurality of antenna element means.

4,101,902
ELECTRONIC SCANNING ANTENNA

Roland Trigon, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 10, 1976, Ser. No. 740,834
Int. Cl.² H01Q *3/26, 3/00, 13/00, 21/10*
U.S. Cl. 343—854 **6 Claims**



1. An electronically scanned antenna comprising:

a linear array of vertically stacked radiators capable of emitting and intercepting microwave energy;

a first and a second waveguide paralleling said array;

a set of first couplers communicating with said first waveguide at a number of spaced-apart locations corresponding to the number of said radiators;

a set of second couplers communicating with said second waveguide at a number of spaced-apart locations corresponding to the number of said radiators;

first transmitter means with at least one first operating frequency connected to said first waveguide;

a set of fixed phase shifters respectively inserted between said first couplers and said radiators for energizing same to emit at least one first beam of microwave energy at said first operating frequency, said first beam having a constant angle of elevation;

second transmitter means with at least one second operating frequency connected to said second waveguide;

a set of variable phase shifters respectively inserted between said first and second couplers in cascade with said fixed phase shifters for energizing said radiators to emit at least one second beam of microwave energy at said second operating frequency, said second beam having an angle of elevation depending on the setting of said variable phase shifters;

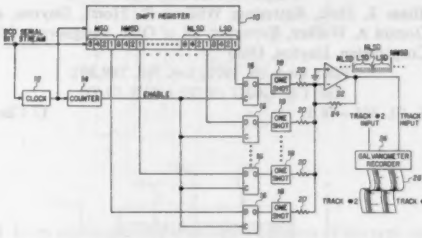
first receiver means connected to said first waveguide for detecting intercepted echoes at said first operating frequency; and

second receiver means connected to said second waveguide for detecting intercepted echoes at said second operating frequency.

4,101,903
METHOD AND APPARATUS FOR MONITORING BCD CONTINUOUSLY VARYING DATA

Larry G. Slay, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 2, 1976, Ser. No. 710,512
Int. Cl.² G01D *5/14*
U.S. Cl. 346—33 R **12 Claims**



1. Apparatus responsive to value changes in binary coded decimal digital words representative of continuously varying data, comprising:

means for receiving each digital word;

a plurality of storage means connected to the output of said receiving means, there being a different one for each of the digits represented in each digital word, each having means for receiving and storing at its output the value of the least significant bit for its associated digit when enabled;

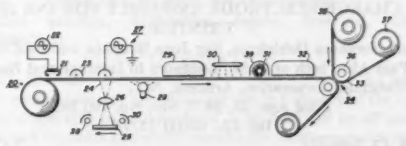
means for enabling said storage means upon receipt of a new digital word, and

a plurality of pulse generators, there being a different one for each of said storage means connected to its output for providing a pulse each time that its associated storage means output changes value irrespective of the direction of change.

4,101,904
MAGNETOGRAPHIC IMAGING MEMBER AND THE METHOD OF ITS USE

John Wolfgang Weigl, West Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1976, Ser. No. 690,453
Int. Cl.² G03G *19/00*
U.S. Cl. 346—74.1 **3 Claims**



1. A method for forming a magnetic latent image which comprises the steps of:

(a) providing an imaging member comprising a photoconductive layer sandwiched between a transparent conductive substrate and an overcoating which comprises a di-

electric material having a pre-magnetized magnetically hard pigment dispersed therein;

(b) forming an electrostatic latent image on the overcoating,

(c) developing the electrostatic latent image with a radiant heat reflective toner; and

(d) exposing the imaging surface to radiant heat sufficient to elevate the temperature of the pigment above its Curie point in the portions of the overcoating where the radiant heat is not reflected by the toner, whereby a latent magnetic image remains in the overcoating corresponding to the developed electrostatic latent image.

4,101,905

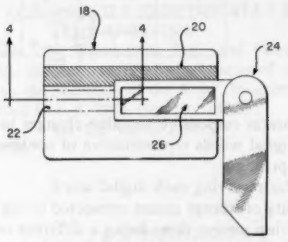
METHOD FOR WRITING AND VIEWING MAGNETIC HUMAN READABLE CHARACTERS AND VIEWING MEANS THEREFOR

William J. Hale, Kettering; William R. Horst, Dayton, and Donald A. Walker, Kettering, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 10, 1976, Ser. No. 749,591

Int. Cl.[2] G03G *19/00;* G01R *33/00*

U.S. Cl. 346—74.1 **17 Claims**



1. A security system comprising:

a record medium having a recording track thereon;

means for magnetically recording data on said recording track in a humanly readable style which is normally invisible; and

a viewing means comprising:

a viewing window which when placed in operative proximity with said recording track responds to said data thereon to form an image on said viewing window corresponding to said data to enable a user of said viewing means to read said data;

magnet means; and

means for providing relative movement between said viewing window and said magnet means to erase said image upon said relative movement;

said magnet means being located on said providing means so as to enable the magnetic lines of flux of said magnet means to lie in the plane of said viewing window during said relative movement.

4,101,906

CHARGE ELECTRODE ASSEMBLY FOR INK JET PRINTER

Mark Sorensen Dahlstrom, San Juan Bautista, and Paul Simon, Palo Alto, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,205

Int. Cl.[2] G01D *15/18*

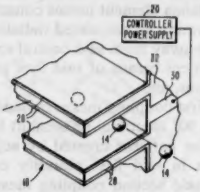
U.S. Cl. 346—75 **7 Claims**

1. A charge electrode assembly useful in an ink jet printer comprising:

a nonconductive ceramic housing;

a series of uniformly spaced grooves formed in said housing;

a layer of a corrosion-resistant non-oxidated noble metal applied directly in each of said grooves to said housing ceramic and insulated from each other, said non-oxidated metal being effectively resistant to dissolution that may be



caused by anodic and cathodic current in the presence of pressure propelled ink droplets.

4,101,907

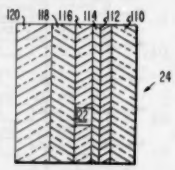
OVERCOAT STRUCTURE FOR OPTICAL VIDEO DISC

Alan Edward Bell, East Windsor; Robert Alfred Bartolini, Trenton, and Allen Bloom, East Windsor, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,847

Int. Cl.[2] G01D *15/34, 15/10*

U.S. Cl. 346—135 **10 Claims**



1. In a recording medium for use with a recording laser beam providing light of a given frequency, said recording medium having a light reflecting layer with a light absorbing layer thereon and an overcoat layer thereover, the improvement comprising a thermal and chemical barrier layer situate between the light absorbing layer and the overcoat layer,

wherein the thickness of said barrier layer is a function of the wavelength of the light from said recording laser and of the refractive index of said barrier layer at said wavelength.

4,101,908

ADJUSTABLE MOUNT FOR ELECTROSTATIC PRINTER STYLUS WITHIN CYLINDRICAL PRINTING ROLLER

Hans-Dieter Hinz, Tornesch; Ulf Rothgordt, Norderstedt, and Franz Schinke, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,613

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2635052

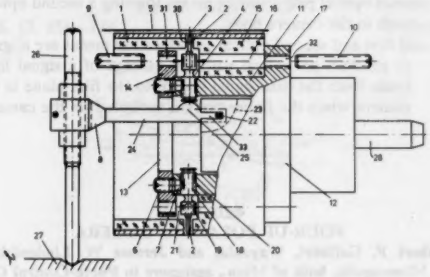
Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—139 C **4 Claims**

1. An electrostatic printer, comprising a rotatable, cylindrical printing roller, having an electrically non-conductive jacket which is provided with at least one aperture, a stylus electrode disposed in each aperture, a rod-shaped electrode holder carrying each said stylus electrode at one end thereof, each stylus electrode freely projecting through the aperture in which it is disposed, said jacket accommodating an insert of electrically conductive material in the form of a hollow cylinder comprising a bottom, each aperture which serves to accommodate a stylus electrode extending through the wall of said hollow cylinder being recessed in the wall of said hollow cylinder,

each electrode holder including (a) an adjusting portion

which projects outside the wall of said cylinder and which supports the stylus electrode and (b) a fixing portion which is axially movable in the aperture in which the stylus electrode carried by the electrode holder is disposed and which is to be secured by means of a fixing

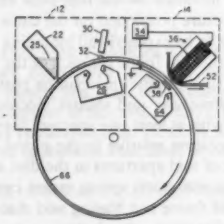


device, said adjusting portion being displaceable transversely of the longitudinal direction of the electrode holder by means of a first adjusting device, each said electrode holder being entirely displaceable in the longitudinal direction thereof by means of a second adjusting device.

4,101,909
MAGNETIC INKING APPARATUS FOR PULSED ELECTRICAL PRINTING

Donald C. Solmon, Newburyport, and Donald J. J. Lennon, Acton, both of Mass., assignors to Epp Corp., Boston, Mass.

Filed Jul. 30, 1976, Ser. No. 710,280
Int. Cl.² G03G *15/16*
U.S. Cl. 346—153 **15 Claims**



1. Apparatus for coating an elongate sheet with ink comprising, in combination,

means for moving the sheet in a longitudinal direction,

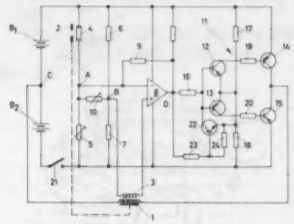
means for depositing a quantity of ink particles loosely upon a surface of the sheet, the particles comprising a magnetizable material, and

means for establishing a stationary magnetic field having components extending from said surface through the deposited particles, said field being oriented and of sufficient magnitude to act in conjunction with the friction of the moving sheet to produce a bead of said particles at said surface rotating about an axis passing substantially through the bead and extending laterally of said direction, whereby a number of the particles in the bead are separated therefrom by said sheet and remain coated thereupon in the form of spaced aggregates of irregular height.

4,101,910
AUTOMATIC DIAPHRAGM CONTROL SYSTEM MEANS FOR PREVENTING ENERGIZATION OF THE DIAPHRAGM ADJUSTING MECHANISM WHEN THE ADJUSTING MECHANISM IS AT THE LIMIT OF ITS ADJUSTING RANGE

Hermann Mayer, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,694
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609618
Int. Cl.² G03B *7/10*
U.S. Cl. 354—42 **6 Claims**



1. In an automatic exposure control system of the type comprised of an adjustable diaphragm, an adjusting motor coupled to the diaphragm for varying the diaphragm setting, the adjusting motor having a limited adjustment range, negative-feedback control means, including photosensitive means exposed to scene light, operative for generating an error signal dependent upon the difference between the actual diaphragm setting and the setting required for the prevailing scene light and operative for energizing the adjusting motor to an extent dependent upon the value of the error signal, in combination therewith, an arrangement for preventing further energization of the adjusting motor when the adjusting motor reaches a limit of its adjustment range and can effect no further change of diaphragm setting but the error signal indicates that a further change of diaphragm setting is required, the arrangement comprising interrupter means activated when the error signal reaches a preselected value and operative when activated for preventing energization of the adjusting motor; and damping means for damping the operation of the adjusting motor and preventing the error signal from reaching the preselected value so long as a limit of the adjustment range has not yet been reached by lowering the value of the error signal to an extent dependent upon the rate at which the adjusting motor changes the diaphragm setting.

4,101,911
EXPOSURE INDICATOR FOR CAMERA HAVING ELECTRICAL SHUTTER

Yoshihisa Maitani, Hachioji, and Atsushi Kidawara, Tachikawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

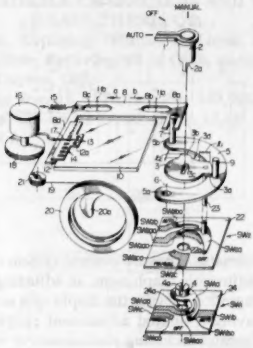
Filed Oct. 28, 1976, Ser. No. 736,566
Claims priority, application Japan, Nov. 6, 1975, 50/150867[U]
Int. Cl.² G03D *17/20*
U.S. Cl. 354—53 **5 Claims**

1. A mode indicator apparatus for use in a camera of the type which is operable in an automatic, a manual and an off mode and which includes an optical viewfinder, said apparatus comprising:

brightness indicator means including a meter pointer extending into the field of view of said viewfinder, said brightness indicator means for adjusting the position of said meter pointer within said field of view of said viewfinder as a function of the brightness of an object being photographed;

a display panel comprising first and second scales; said first scale including a plurality of spaced numbers disposed along said panel, each said number representing a different exposure period; said second scale including a zero method index;

said display panel being movable between: a first position wherein said first and second scales are within the field of view of said viewfinder, said first and second scales cooperating with said meter pointer to provide photometric information relevant to an automatic mode of operation; a second position wherein only said second index is within the field of view of said viewfinder, said second index cooperating with said meter pointer to provide photometric information relevant to a manual mode of operation;



and a third position wherein neither said first nor said second scales are within the field of view of said viewfinder;

switch means movable between a first, a second and a third position for placing said camera in an automatic, a manual and an off mode, respectively; and

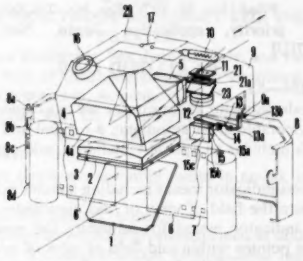
display panel locator means for placing said display panel in said first, said second and said third position responsive to movement of said switch means into said first, said second and said third positions, respectively, whereby the relative position of said display panel within the field of view of said viewfinder provides a visual indication of whether said camera is in said automatic, said manual, or said off mode.

4,101,912

DATA RECORDING DEVICE FOR CAMERA

Yoshiaki Watanabe, Fujisawa; Akio Sunouchi, Tokyo, and Youichi Okuno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,492
Claims priority, application Japan, Aug. 20, 1975, 50/100722
Int. Cl.² G03B *13/02, 17/24*
U.S. Cl. 354—106 **3 Claims**



1. A data recording device for a camera having a body with a film plane and having an interchangeable finder with a body detachably mounted on the camera body, comprising:

a data illumination device in the finder body,

a data signal source provided in the finder body,

first optical path forming means forming a first optical path in the finder body, and

second optical path forming means forming a second optical path in the camera body,

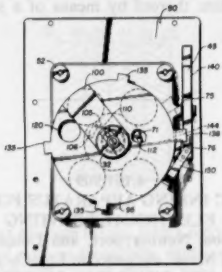
said first and second optical path forming means are aligned to produce an optical path for passage of a signal light beam from the data signal source to the film plane in the camera when the finder body is mounted on the camera.

4,101,913

FOUR-UP POLAROID CAMERA

Albert F. Gallistel, Wayzata, and Jerome W. Lindenfelser, Minneapolis, both of Minn., assignors to Photo-Control Corporation, Minneapolis, Minn.

Filed Nov. 19, 1975, Ser. No. 633,248
Int. Cl.² G03B *35/00*
U.S. Cl. 354—122 **17 Claims**

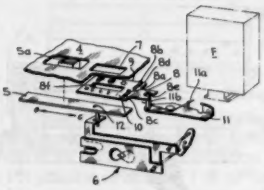


1. A plural camera comprising, a film pack enclosure and a means for advancing the film therein for individual film frames, a camera frame mounted on the film pack enclosure, a plural camera lens structure positioned on the camera frame in front of the film frame to be exposed and including means for isolating a portion of the film frame for each of the lens of the plural lens structure, a single shutter mechanism positioned in front of the plural lens structure, said shutter mechanism being comprised of a disc with at least one aperture therein journaled on said frame for rotation relative to the plural lens structure so that at least one of said apertures in the disc aligns with a lens of the plural lens structure, spring means connected between said disc and said frame and biasing said disc for rotation in a predetermined direction, plural stop means formed on the periphery of said disc, one of said stop means being adapted to engage a fixed abutment mounted on the camera frame for defining limited rotation of the disc in said predetermined direction, a shutter release mechanism, each of said stop means being designed to engage said shutter release mechanism when positioned adjacent to the shutter release to restrict rotation of the disc, said disc when released from said stop means having limited rotation in said predetermined direction to bring at least one of said apertures in the disc into alignment with one of the lens of said plural lens structure, means for covering said aperture when said disc is rotated in a direction opposite to said predetermined direction, and means for manually rotating said disc in said opposite direction, said means for covering said aperture when said disc is rotated in a direction opposite the predetermined direction being a blade for covering the aperture which is journaled on the frame and movable relative to the disc a limited second rotation.

4,101,914
INDICATING DEVICES FOR USE IN CAMERAS

Maki Yamashita, Sakai, and Yasuzi Kogure, Kawanishi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Mar. 23, 1977, Ser. No. 782,298
Claims priority, application Japan, Mar. 31, 1976, 51-40040[U]
Int. Cl.[2] G03B 15/02
U.S. Cl. 354—128 19 Claims



1. In a camera, wherein a flash means is removably mounted on the camera body and a diaphragm aperture is manually adjustable, apparatus comprising:

a diaphragm setting member movable for varying said diaphragm aperture and including an index;

first scale means including a plurality of symbols for indicating a set position of said diaphragm setting member for daylight photography;

second scale means including a plurality of symbols for indicating a set position of said diaphragm setting member for flash photography;

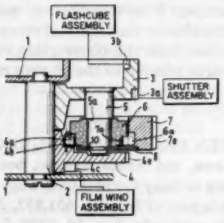
indicating means selectively movable between a first position to expose all the symbols of only said first scale means and said index and a second position to expose all the symbols of only said second scale means and said index; and

control means operated upon attachment and removal of said flash means to and from the camera body respectively, said indicating means being interlocked with said control means for movement to said first position with said flash means attached to said camera body, and for movement to said second position with said flash means removed from said camera body.

4,101,915
GEARING FOR CAMERA OPERATION

Karl Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke, Bunde, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 612,997, Sep. 1, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,302
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1974, 2446068
Int. Cl.[2] G03B 15/03, 17/42; F16H 1/28
U.S. Cl. 354—144 10 Claims

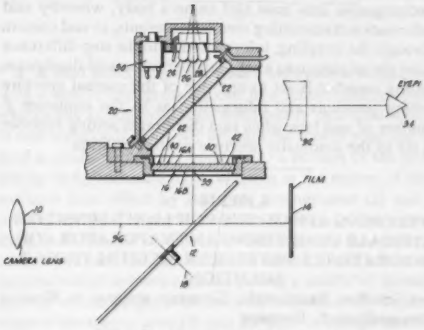


1. A gear assembly for a camera adapted to coordinately perform at least two functions in said camera comprising an internal gear, a plurality of planetary gears in mesh with said internal gear, a planetary gear carrier, said plurality of planetary gears being rotatably mounted on said planetary gear carrier, a sun wheel operatively connected to said plurality of planetary gears, a stationary shaft, said planetary gear carrier and said sun wheel being rotatably mounted on said stationary shaft, means for rotating said internal gear, said planetary gear carrier being rotated about said stationary shaft as said internal gear is rotated, a first set of gear teeth on said planetary carrier for performing a first function, and a second set of gear teeth on said planetary carrier for performing a second function.

4,101,916
ILLUMINATED GROUND GLASS FOR CAMERA

Robert E. Gottschalk, Los Angeles, and Albert L. Mayer, Tarzana, both of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

Filed Aug. 2, 1976, Ser. No. 711,062
Int. Cl.[2] G03B 13/02, 19/12
U.S. Cl. 354—219 7 Claims

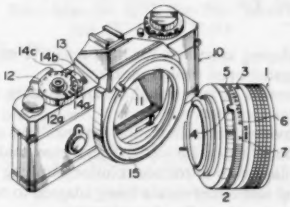


5. In a viewing system for cameras, a light transmitting plate having one side thereof formed with a matte surface comparable to a ground glass surface, light reflecting material fixed on the other side of said plate and positioned inwardly from the edges thereof so as to define boundary limits of a scene to be photographed.

4,101,917
EXCHANGEABLE LENSES FOR SINGLE LENS REFLEX CAMERAS

Hiroshi Ueda, Nara, and Shuzo Matsushita, Ikeda, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1977, Ser. No. 800,875
Claims priority, application Japan, Jun. 7, 1976, 51-65626
Int. Cl.[2] G03B 9/02
U.S. Cl. 354—273 6 Claims



1. An exchangeable lens for use in a single lens reflex camera which includes a camera body and an information receiving member for receiving information from said exchangeable lens, said exchangeable lens comprising:

a lens barrel containing at least one optical lens and a controllable diaphragm aperture,

a fixed index on the surface of said lens barrel,

a rotatable diaphragm setting member about the outer peripheral surface of said lens barrel, said diaphragm setting member having thereon an indicia for automatic aperture control and a graduated aperture scale for manual aperture setting, said aperture scale extending from a minimum to a maximum *f*-number of said exchangeable lens, said indicia being spaced a predetermined distance from a specific *f*-number position in the direction in which said aperture scale extends, said diaphragm setting member being settable to any one of the manual aperture setting positions in which any one of the *f*-numbers aligns with said index and to an automatic aperture control position in which said indicia aligns with said index,

a single information transmitting member integrally formed with said diaphragm setting member and spaced a predetermined distance from the minimum *f*-number position in the direction in which said scale extends, said information transmitting member being capable of being coupled with said information receiving member upon mounting of said exchangeable lens onto said camera body, whereby said information transmitting member transmits, to said camera through the coupling, information as to the step difference from the minimum to a set *f*-number when said diaphragm setting member is set to any one of the manual aperture setting positions and information as to the minimum *f*-number of said lens when said diaphragm setting member is set to the automatic aperture control position.

4,101,918

DEVELOPING APPARATUS FOR LIGHT-SENSITIVE MATERIALS COMPRISING AN EVAPORATOR FOR EVAPORATING A DEVELOPER MEDIUM FROM A SOLUTION

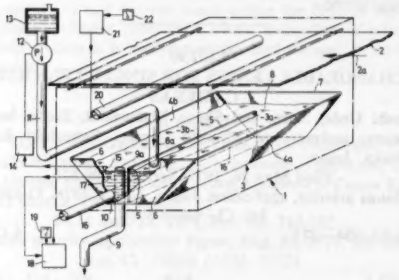
Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Nov. 29, 1976, Ser. No. 745,980

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553769

Int. Cl.² G03D *13/00*

U.S. Cl. 354—299 **6 Claims**



1. A developing apparatus for light-sensitive material comprising elongated open trough means,

partition means in said trough means dividing said trough means into sections,

means providing communication between said sections,

inlet and outlet means for said trough means, said inlet means being adapted to introduce solution into one of said sections and said outlet means being adapted to remove solution from another of said sections,

heating means in said section containing said outlet means and being positioned below an opening of said outlet means in said trough means,

and temperature sensor means so positioned near said outlet means and within said trough means that, in operation, it is wholly immersed in the solution, said temperature sensor means being connected to said heating means via thermostat means.

4,101,919

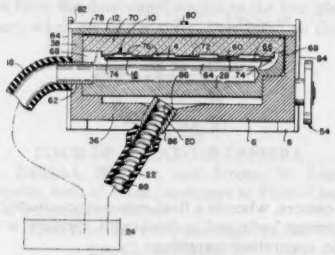
FILM PROCESSING APPARATUS

Steve Ammann, Cupertino, Calif., assignor to Quantor Corporation, Mountain View, Calif.

Filed Aug. 2, 1976, Ser. No. 710,838

Int. Cl.² G03D *3/08*

U.S. Cl. 354—319 **12 Claims**



9. A film processor for developing exposed film by sequentially contacting an emulsion side of the film with a plurality of processing liquids, the processor comprising:

an elongate, substantially horizontal tank having a plurality of serially arranged compartments separated from each other by upright side walls to prevent the liquids from flowing between the compartments, the tank including a drainage opening for each compartment;

means for transporting the film in a substantially horizontal path past the side walls and the compartments;

nozzle means for each compartment disposed between an underside of the film and the drainage opening of that compartment, the nozzle means being constructed to contact every part of the film underside with processing liquid as the film moves past the corresponding compartment;

a cover plate disposed adjacent an upwardly facing side of the film and means for supporting the cover plate so that the film can move between the cover plate and the nozzle means, the cover plate including a plurality of depressions on its side facing the film to prevent film from adhering to the cover plate as it moves past it;

means for removing processing liquid from the film before the film enters the next adjacent compartment to prevent an intermixing of the liquids;

stationary means extending over substantially the full length of the tank and engaging lateral edges of the film as it moves through the processor for guiding the film along a straight, substantially horizontal path;

a closure member disposed over the cover plates and closing each compartment from the exterior, means for securing the closure member to the tank, and means for spacing the closure member from the cover plate so that the cover plate is movable relative to the closure member.

4,101,920

GREEN LIGHT EMITTING DIODE

Hiroyuki Nagasawa, and Kunio Kaneko, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 651,852, Jan. 23, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,230

Claims priority, application Japan, Jan. 29, 1975, 50-12228

Int. Cl.² H01L *33/00*

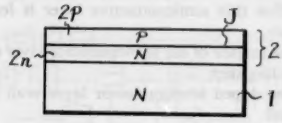
U.S. Cl. 357—17 **5 Claims**

1. A green light emitting diode comprising:

a semiconductor substrate of gallium phosphide; and

an epitaxial layer of gallium phosphide having nitrogen therein formed on said substrate;

said epitaxial layer having an N type layer portion directly formed on said substrate, a P type layer portion formed on and interfaced with said N type layer portion, a PN junction being formed therebetween, said N type layer portion being doped to have a donor concentration of between 1



$\times 10^{17}$ and 2×10^{18} cm^{-3}, said P type layer portion being doped to have an acceptor concentration gradient adjacent said PN junction of between 7×10^{20} cm^{-4} and 1.5×10^{21} cm^{-4}, the concentration of nitrogen in said gallium phosphide epitaxial layer being between 1×10^{18} cm^{-3} and 1×10^{19} cm^{-3} within a zone having a thickness less than 3 μm from the PN junction and less than said concentration of nitrogen out of said zone.

4,101,921

MEMORY TYPE INSULATING GATE FIELD EFFECT SEMICONDUCTOR DEVICE

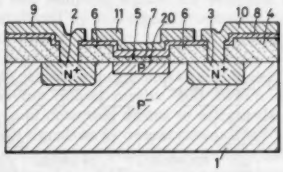
Takashi Shimada, Yamato; Kenichi Inoue, Kawasaki; Takaji Ohtsu, Hatano; Hidenobu Mochizuki, Atsugi, and Jiro Yamaguchi, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,099

Claims priority, application Japan, Mar. 1, 1976, 51-21998

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23 **9 Claims**



1. In a memory type insulated gate field effect semiconductor device including

a semiconductor layer of one conductivity type having one surface,

a source region of the opposite conductivity type formed adjacent to said one surface of said semiconductor layer,

a drain region of the opposite conductivity type formed adjacent to said one surface of said semiconductor layer,

a gate insulating layer affixed to the surface of said semiconductor layer, comprising a first insulating layer having a pair of thick gate guarding portions adjacent said source and drain regions, and a thin memory portion intermediate between said thick gate guarding portions and second insulating layer covering, said thin memory portion being between said thick gate portions, and

a gate electrode deposited on the surface of said gate insulating layer,

the improvement comprising means for shifting a threshold voltage of said thin memory portion substantially closer to a threshold voltage of said thick guarding portions, said means including a doped region of P type conductivity adjacent to said one surface under said thin memory portion and having a different surface impurity concentration than a surface impurity concentration of said semiconductor layer under said thick guarding portions.

4,101,922

FIELD EFFECT TRANSISTOR WITH A SHORT CHANNEL LENGTH

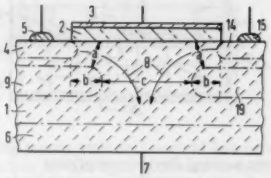
Jenoe Tihanyi, Munich, and Voachim Hoepfner, Planegg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 9, 1977, Ser. No. 775,978

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611338

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23 **10 Claims**



1. A field effect transistor with a MIS gate arrangement and with a source and drain regions in a semiconductor body, an electrically conductive zone additionally provided which lies in said semiconductor body beneath the source zone and which is of a conductivity type opposite to a portion of the semiconductor body surrounding it, wherein in the region of the controllable field effect by said gate arrangement (2) said additional zone (9) is spaced a distance (a) from said gate arrangement and from the boundary surface between the semiconductor body (1) and the gate insulation layer (2), and is bounded by an edge which forms a channel having a width "*c*" in said zone (9) and which projects laterally by a distance (b) beyond the edge of the source zone (4) into the path of charge carriers and where the distance (*b*) is approximately 1 to 10 times the thickness (*d*) of the gate insulation layer (2), and the distance (*a*) is approximately 1 to 5 times the thickness (*d*) of the gate insulation layer (2) and where the ratio of *b:a* is approximately equal to 1:1 to 10:1, the source zone (4) and the zone (9) are of opposite conductivity types and the degree of doping of the zone (9) is selected to be such that with the maximum provided electrical operating voltage between the drain electrode (6) and the source zone (4), the majority charge carriers of the zone (9) are not depleted.

4,101,923

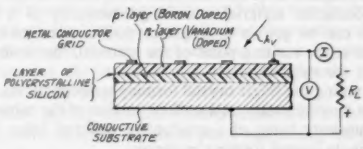
SOLAR CELLS

Arnold G. Gulko, and Jacob H. Steinberg, both of 2001 Jeff. Davis, #609, Arlington, Va. 22202

Filed Mar. 22, 1977, Ser. No. 780,287

Int. Cl.[2] H01L *27/14*

U.S. Cl. 357—30 **8 Claims**

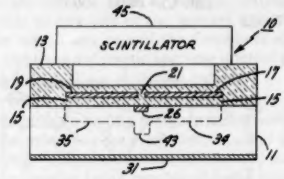


1. A solar cell comprising a layer of crystalline silicon doped with boron on at least one surface thereof, and having the other surface doped with vanadium wherein a p-n junction is formed therebetween.

4,101,924
SEMICONDUCTOR RADIATION DETECTOR

Dale M. Brown, and Marvin Garfinkel, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,080
Int. Cl.[2] H01L 27/14; G01T 1/22
U.S. Cl. 357—30 7 Claims

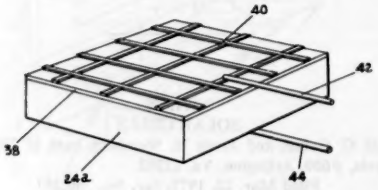


1. A radiation sensing device comprising
a substrate of monocrystalline semiconductor material of one conductivity type,
a first layer of a transparent insulating material overlying a major surface of said substrate,
a second layer of a transparent conductive material overlying said first layer and forming a first capacitor with said substrate and said first layer,
a region of opposite conductivity type in said substrate adjacent said major surface forming a PN junction therewith, said PN junction having a first edge in said major surface and underlying said second layer of transparent conductive material, the area of said region of opposite conductivity type in said major surface being substantially smaller than the area of said second layer of transparent conductive material.

4,101,925
CENTRIFUGAL FORMING THIN FILMS AND SEMICONDUCTORS AND SEMICONDUCTOR DEVICES

Larry P. Kelley, 1024 State St., and Craig A. Hardy, Circle Dr., both of Hart, Mich. 49420

Continuation-in-part of Ser. No. 594,107, Jul. 8, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 787,750
Int. Cl.[2] H01L 23/48
U.S. Cl. 357—68 16 Claims

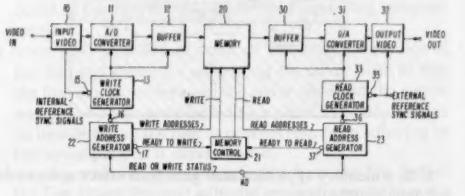


1. A method of forming a semiconductor device having a thin crystalline layer on a substrate from single crystal forming semiconductor material consisting essentially of a material which can be grown in single crystalline form onto a seed crystal at the melting point of the material, the method comprising the steps of:
providing the single crystal forming semiconductor material in a molten state on a surface portion of the substrate, the substrate being of a conductive material other than the single crystal forming material;
heating the crystal forming material to maintain its molten state and while the crystal forming material is in the molten state, rotating the substrate about an axis substantially parallel to the surface thereof at a speed sufficient to overcome the surface tension of the molten material so as to spread by centrifugal force the molten material into a thin, substantially uniform, molten layer of the single crystal forming material, thinner than that obtainable under ordinary gravimetric conditions;
cooling the molten layer of the single crystal forming material while maintaining the speed of rotation of the substrate to solidify without epitaxial growth the entire thickness of the molten layer whereby a substantially monocrystalline thin semiconductive layer is formed on the substrate;
doping the surface of the semiconductor layer subsequent to the cooling step;
plating the doped semiconductor layer with a conductive grid; and
wherein the substrate forms a conductor as a part of the semiconductor device.

4,101,926
TELEVISION SYNCHRONIZING APPARATUS

Robert Adams Dischert, Burlington; Arthur James Banks, Cherry Hill, and Robert Sherman Hopkins, Jr., Marlton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,944
Claims priority, application United Kingdom, Mar. 19, 1976, 11114/76
Int. Cl.[2] H04N 9/44, 9/46
U.S. Cl. 358—17 3 Claims

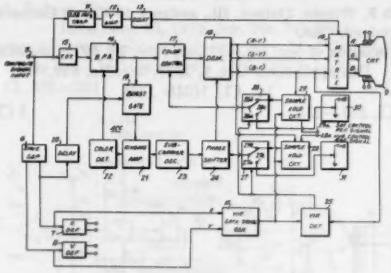


1. A television signal synchronizer in which incoming video signals are written into memory storage means, said incoming video signals comprising one or more television fields, each of said television fields comprising horizontal line signals having a horizontal blanking interval containing horizontal and burst synchronizing signal components and an active image information portion, said burst signal component being opposite in phase from one of said television fields to another, comprising:
coherent memory storage means having preassigned fixed burst phasing for each line store of said memory storage means;
signal processing means for developing a composite horizontal sync and burst timing control signal indicative of the timing of said incoming video signal; and
delay means responsive to said control signal for delaying the writing into memory of only said active video image information portion(s) so as to write said video image information portion into said memory storage means consistent with said preassigned fixed burst phasing.

4,101,927
VIR CONTROL APPARATUS FOR COLOR TELEVISION RECEIVER

Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,869
Claims priority, application Japan, Dec. 27, 1975, 50-156974
Int. Cl.[2] H04N 9/535, 5/14
U.S. Cl. 358—27 21 Claims



1. Color television receiving apparatus for receiving a composite color television signal including horizontal synchronizing signals, color burst signals and luminance and chrominance components, the composite color television signal being of the type which additionally may include a VIR signal provided in a predetermined line interval during the vertical retrace interval, said apparatus comprising signal processing means for processing said received composite color television signal to produce a video picture therefrom; signal generating means for generating sampling signals during the predetermined line intervals in which said VIR signal is provided; detecting means coupled to said signal processing means and responsive to said sampling signals to detect if said VIR signal is included in said received composite color television signal; sampling means responsive to said sampling signals for sampling at least one component produced by said signal processing means to produce sampled control signals; manually operable means for producing manually adjustable control signals; switch means coupled to said sampling means and to said manually operable means and having output means, said switch means being controlled by said detecting means to selectively supply said sampled control signals to its output means if the VIR signal is detected and to supply said manually adjustable control signals to its output means if the VIR signal is not detected; and control means responsive to the control signals selectively supplied to said output means of said switch means for controlling said signal processing means, thereby controlling predetermined characteristics of said video picture.

4,101,928
COLOR TELEVISION RECEIVER

Tadashi Sato, Yono; Masaru Ibuka; Yoshio Ishigaki, both of Tokyo, and Hiroshi Sahara, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,757
Claims priority, application Japan, Dec. 3, 1975, 50-145402
Int. Cl.[2] H04N 9/535, 9/62
U.S. Cl. 358—28 7 Claims

1. A color television receiver comprising:

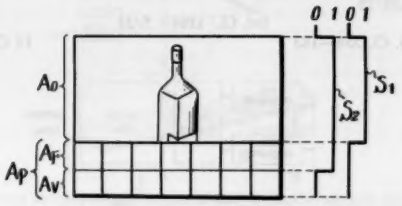
a cathode ray tube including a screen emiting light in a plurality of colors;

circuit means responsive to received color television signals and connected to said tube to produce a color television picture on said screen;

first hue control means connected to said circuit means to vary the hue of said picture;

first generating means to generate reference signals of predetermined relationship, said first generating means being connected to said circuit means to cause a predetermined area of said screen to produce light of a predetermined hue; and

second generating means to generate signals of variable relationship, said second generating means being connected to said circuit means to cause a different predetermined area of said screen to produce light, said second

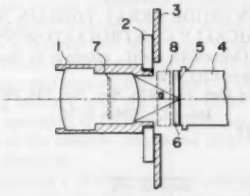


generating means including second hue control means to vary the hue of said light produced in said different area simultaneously with the control of the hue of said picture, said second hue control means having first and second gain controlled amplifiers the gains of which are controlled complementarily with respect to each other in response to variation of said first hue control means.

4,101,929
COLOR ENCODING VIDEO SYSTEM WITH OPTICAL LOW PASS FILTER

Shoichi Ohneda, Wakayama, and Yukio Okano, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1977, Ser. No. 768,869
Claims priority, application Japan, Feb. 20, 1976, 51-16977
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—44 12 Claims



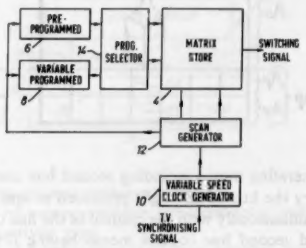
1. In a color encoding video system having an image forming optical system, means for mounting the optical system, a color encoding filter operatively associated with the optical system for producing a representative color signal, a photosensitive element positioned approximately at the focal plane of the optical system and scanned for producing signals representative of both the luminous intensity and chromatic values of an object imaged thereon and scanning means for detecting and processing the luminous and chromatic signals, the improvement comprising:

an optical grating low pass filter positioned in a plane substantially adjacent the focal plane containing the photosensitive element, the grating pattern having a spatial frequency along the scanning direction limited to a value not greater than the highest spatial frequency available for detection of luminous signals of the object imaged on the photosensitive element by the means for detecting.

4,101,930
TELEVISION PICTURE WIPING

Richard Norman Sanders, Chesham, and William James Crossley, Maidenhead, both of England, assignors to Prowest Electronics Limited, Windsor, England

Filed Nov. 29, 1976, Ser. No. 745,687
Claims priority, application United Kingdom, Dec. 1, 1975, 49230/75
Int. Cl.[2] H04N 5/22
U.S. Cl. 358—183 **11 Claims**

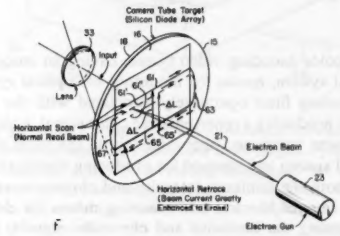


1. A television arrangement for receiving respective input television signals from each of a plurality of sources and providing output television signals, derived from at least one of said input signals, for display on a television picture area, said arrangement including storage means having a respective address for each of a plurality of substantially non-overlapping portions of said area, said storage means storing, at said addresses, switching information which indicates picture content replacement sequence in which the output television signals, previously derived from one of said sources and displayed on respective portions of said picture area, are to be derived from another of said sources, and scanning means for scanning said switching information to produce a switching signal adapted to selectively control, in accordance with said sequence, the derivation of said television output signals from said television input signals.

4,101,931
SILICON DIODE ARRAY VIDICON WITH ELECTRONICALLY CONTROLLED SENSITIVITY

Leon S. Yaggy, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 29, 1976, Ser. No. 736,790
Int. Cl.[2] H04N 5/36
U.S. Cl. 358—217 **11 Claims**



1. A method of electronically selecting the sensitivity of an imaging device having a silicon diode array target comprising steps of:

(a) exposing the front of said target to an image;

(b) periodically scanning successive lines on the back of said target with an erasing electron beam;

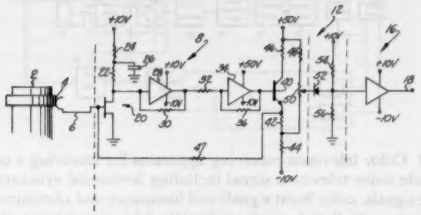
(c) periodically scanning each of said successive target lines with a reading electron beam a uniform time after it has been scanned by said erasing electron beam; and

(d) selecting the time lag of said scanning electron beam relative to said erasing electron beam to attain a desired sensitivity for said imaging device.

4,101,932
VIDEO PREAMPLIFIER FOR CAMERA OPERATED IN ACT MODE

Joseph F. Wiggin, Quincy, Ill., assignor to Harris Corporation Cleveland, Ohio

Continuation of Ser. No. 632,245, Nov. 17, 1975, abandoned. This application Oct. 6, 1977, Ser. No. 839,980
Int. Cl.[2] H04N 5/14
U.S. Cl. 358—223 **5 Claims**



1. An improved video preamplifier for use in a television camera having an imaging tube operated in an ACT mode for producing a video signal having large signal, unsuppressed white pulses interspersed periodically thereon due to said ACT operation, said imaging tube having a video output circuit, said improved video preamplifier comprising:

first amplifier means serially connected to said video output circuit for providing first amplification of said video signal, including said unsuppressed white pulses, without being overdriven thereby;

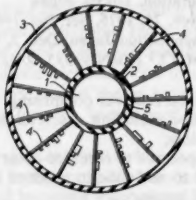
second amplifier means serially connected to said first amplifier means for second amplification of said video signal; and,

clipping circuit means interposed between said first amplifier means and said second amplifier means for clipping said large signal white pulses to prevent overdriving of said second amplifier means.

4,101,933
TELEVISION CAMERAS

Michael Richmond, Witham, and Richard Michael Hesketh Prichard, Stock, both of England, assignors to Elliott Brothers (London) Limited, England

Filed Aug. 2, 1976, Ser. No. 710,668
Claims priority, application United Kingdom, Aug. 9, 1975, 33291/75
Int. Cl.[2] H04N 5/64
U.S. Cl. 358—254 **11 Claims**



1. A television camera comprising a television camera tube and a yoke within which the camera tube is at least partially disposed, and a plurality of electronic sub-assembly units distributed around said tube and outside of said yoke, each sub-

assembly unit comprising a circuit board substrate, carrying electronic components, each substrate extending in a plane which extends radially from the axis of said camera tube.

4,101,934

CODING SYSTEM

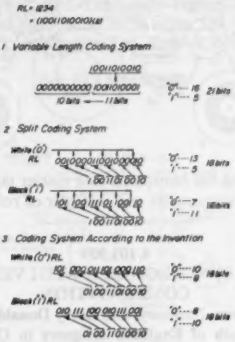
Kenji Fukuoka, Fussa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1976, Ser. No. 741,994

Claims priority, application Japan, Nov. 17, 1975, 50-137215

Int. Cl.[2] H04N *1/40, 7/12*; G08B *1/08*

U.S. Cl. 358—261 **3 Claims**



1. A coding method comprising forming an assembly of code words prepared by converting a length composed of a train of "0" and a length composed of a train of "1" into a binary coded m-ary digit composed of *m* original elements each represented by a binary code including *n* bits, said "0" and "1" being a binary signal of facsimile to be coded, dividing said binary coded m-ary digit code into blocks each including *n* bits, said blocks each including an original unit, selecting $2m$ code words without permitting any overlap thereof from an original set of binary code words having a given length of at least $n+1$ bits, dividing said $2m$ code words into two groups each including *m* code words, bringing the number of "0" constituting all of the code words belonging to each group into agreement with the number of "1" thereof, and arranging in order each of the code words belonging to each group, said coding method further comprising converting each block of that binary coded m-ary digit which is associated with said length composed of a train of "0" of said binary signal into a code word having that order which corresponds to the original order of the m-ary digit which means said block in one of said groups and converting each block of that binary coded m-ary digit which is associated with said length composed of a train of "1" of said binary signal into a code word having that order which corresponds to said original order of the m-ary digit which means said block in another group.

4,101,935

ELECTRON BEAM READING ARRANGEMENTS

Robert Mark Quilliam, Chelmsford, England, assignor to The Marconi Company Limited, England

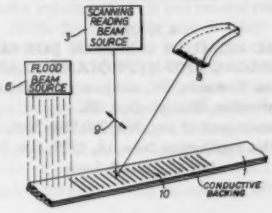
Filed Jul. 11, 1975, Ser. No. 595,106

Claims priority, application United Kingdom, Jul. 11, 1974, 30687/74

Int. Cl.[2] H04N *1/00, 1/28*

U.S. Cl. 358—293 **8 Claims**

1. A method of developing an electrical signal corresponding to surface modulations in a dielectric surface comprising the steps of charging said dielectric surface with electrons, scanning said charged dielectric surface with a reading electron beam and collecting predominantly electrons of said beam



reflected by the surface charge of said dielectric surface at said modulations.

4,101,936

AUTOMATIC TAPE LOADING TYPE REPRODUCING APPARATUS HAVING INTERMITTENT TAPE SHIFTING CAPABILITY

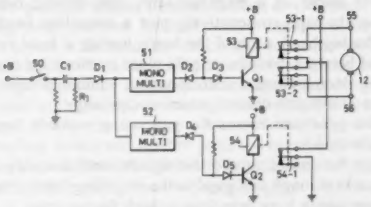
Kazue Shinhara, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 4, 1977, Ser. No. 756,907

Claims priority, application Japan, Jan. 7, 1976, 51-931

Int. Cl.[2] G11B *15/20*

U.S. Cl. 360—10 **6 Claims**



1. An automatic tape loading type reproducing apparatus comprising:

a guide drum having at least one rotating head;

loading means for operating with a cassette having a supply reel and a take-up reel with tape wound thereon, said loading means including means for drawing the tape from the cassette and loading the drawn out tape into a path in wrapping contact with the guide drum responsive to a loading operation in a forward direction, and for storing the tape in the cassette responsive to an operation in the reverse direction;

means comprising a driving motor selectively operating in a forward direction to drive the loading means in a forward direction and rotating in a reverse direction to drive the loading means in the reverse direction operation;

means for imparting a torque for urging the take-up reel to tension the tape in its taking up direction;

tape driving means for causing tape travel during normal reproduction and for terminating the tape travel during still picture reproduction;

a switch means for momentary actuation during the still picture reproduction; and

electrical circuit means operating in response to each of the momentary actuations of the switch to cause the driving motor to rotate briefly in a reverse direction for a specific interval of time and thereafter to rotate in a forward direction for at least said specific interval of time,

whereby actuation of the switch during still picture reproduction causes the tape driving means to cease normal operation, to take up a short section of the tape on the take-up reel in response to the reverse direction operation of the loading means and to pay out the tape from the

supply reel so that the tape is shifted intermittently in response to the forward direction operation of the loading means.

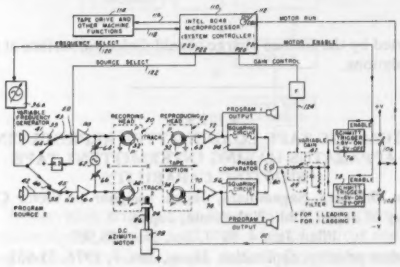
4,101,937
AUTOMATIC AZIMUTH CONTROL FOR MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Continuation-in-part of Ser. No. 740,958, Nov. 11, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,499

Int. Cl.[2] G11B *5/43*

U.S. Cl. 360—76 **16 Claims**



1. In apparatus for recording and reproducing signals along multiple tracks on a magnetic tape, tape driving means for moving the tape consecutively past a recording head and a reproducing head, each of the heads having at least two gaps defined between transducer pole piece portions for recording or reproducing along a corresponding number of tape tracks, automatic azimuth control means comprising:

signal generator means for generating variable frequency test signals:

means for recording said test signals simultaneously on said tracks through said gaps on the recording head at frequencies which vary from low to high frequency;

means for making productions of said test signals through said gaps on the reproducing head;

means for sensing time relationship of such test signal reproductions; and

skew means responsive to time differential of said test signal reproductions to skew the head-to-tape relation at one of said heads progressively in a direction to synchronize said test signal reproductions.

4,101,938
APPARATUS FOR REPRODUCING HIGH FIDELITY MAGNETIC TAPES FROM A MASTER TAPE

Ichiro Hanai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

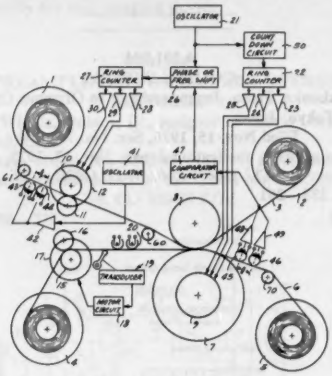
Filed Feb. 6, 1974, Ser. No. 440,263

Claims priority, application Japan, Feb. 9, 1973, 48-17437[U]

Int. Cl.[2] G11B *5/86, 15/43*

U.S. Cl. 360—16 **2 Claims**

1. A thermal printing apparatus comprising, a master tape driving means, a slave tape driving means, a pair of driven rollers contacting said master tape with said slave tape, heating means for heating said slave tape before it contacts said master tape, a motor control means connected to said master tape driving means, a first pair of magnetic heads mounted adjacent said master tape and spaced longitudinally a predetermined distance for recording the same signal on separate channels on said master tape before it reaches said master tape driving means, a second pair of magnetic heads mounted adjacent said slave tape after it has passed said rollers and has shrunk and spaced longitudinally said predetermined distance for reading signals from separate channels printed on said slave tape, a comparator circuit receiving the outputs of said second pair of magnetic heads and supplying a signal to said motor control



means to control the tension on said master tape between said master tape driving means and said pair of rollers.

4,101,939
VIDEO SYNCHRONIZER WITH VELOCITY COMPENSATION

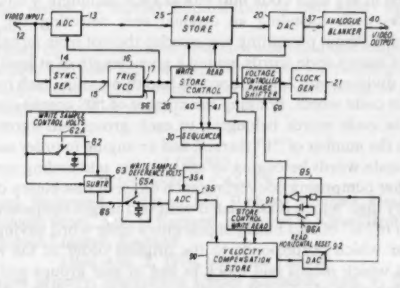
David Peter Owen, Newbury, and Barry Donald Ruberry Miles, Thatcham, both of England, assignors to Quantel Limited, England

Filed Feb. 17, 1977, Ser. No. 769,615

Claims priority, application United Kingdom, Feb. 19, 1976, 6588/76

Int. Cl.[2] H04N *5/78*

U.S. Cl. 360—36 **12 Claims**



1. A video synchroniser comprising:

(a) a first analogue-to-digital converter for converting an incoming analogue video signal to digital form;

(b) a video store for receiving successive lines of video information in digital form from said converter;

(c) a digital-to-analogue converter for converting a digital output signal from said store into analogue form;

(d) control means for writing-in and reading-out the digital information into and from said store;

(e) a triggered voltage controlled input oscillator for determining the rate of conversion of said analogue signal to digital form and the rate of writing into said store;

(f) an output oscillator for controlling the rate of reading out of the digital information form said store and the rate of conversion into analogue form;

(g) sampling means for sampling the input oscillator controlling voltage during one line;

(h) measuring means for detecting any voltage difference in the controlling voltage during successive lines;

(i) a second analogue-to-digital converter for converting the analogue voltage difference detected by said measuring means into digital form;
(j) digital storage means for retaining the digital voltage from said converter means, and
(k) phase shifter means for shifting the phase of the output oscillator in dependence on the voltage difference held by said digital storage means.

4,101,940

CIRCUIT FOR DELAYING A COMPOSITE VIDEO SIGNAL BY A LINE DURATION, PARTICULARLY FOR USE WITH A VIDEO RECORD PLAYER

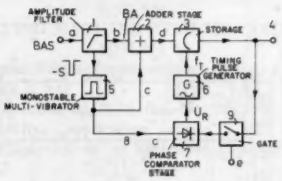
Werner Scholz, Gehrden, Germany, assignor to Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Switzerland

Filed Dec. 23, 1976, Ser. No. 753,620

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558168

Int. Cl.[2] H04N *5/79*

U.S. Cl. 360—37 **11 Claims**



1. In a circuit for delaying a composite input video signal, having blanking intervals and including line sync pulses increasing the amplitude of the input signal, by the duration of at least one line, the circuit including a timed storage, having an input and an output, controlled by a timing pulse sequence from a generator, with a variable obtained, by phase comparison, from the input and output of the storage, and which controls the frequency of the timing pulse sequence in a manner such that the delay time is always equal to the actual duration of a line: the improvement comprising, in combination, means operable to separate the line sync pulses from the input signal and to feed the video signal, less the line sync pulses, to the input of said storage; means deriving, from the separated line sync pulses, pulses having an amplitude within the amplitude range of the video signal less the sync pulses and having a constant duration; and means adding the derived pulses, during the line blanking intervals, to the video signal fed to said storage.

4,101,941

AUTOMATIC TAPE RUN-REVERSING DEVICE

Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

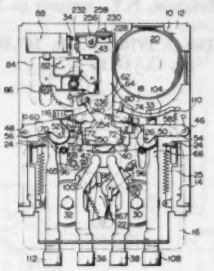
Filed Oct. 29, 1976, Ser. No. 736,825

Claims priority, application Japan, Nov. 6, 1975, 50-133407; Nov. 6, 1975, 50-133408; Nov. 6, 1975, 50-133409; Nov. 6, 1975, 50-133410; Nov. 6, 1975, 50-133411; Feb. 6, 1976, 51-12013; Feb. 6, 1976, 51-12581[U]; Feb. 6, 1976, 51-12582[U]

Int. Cl.[2] G11B *15/48, 21/02, 21/08*

U.S. Cl. 360—74 **11 Claims**

1. An automatic tape run-reversing device which comprises a one channel type magnetic head; tape-driving means for causing the magnetic tape to run alternately in opposite directions; said tape-driving means comprising a motor; a rotation-initiating member driven by the motor; first and second tape-driving unis formed of first and second capstans disposed on both sides of the magnetic head and designed to rotate by the motor in opposite directions and first and second pinch rollers for causing the magnetic tape to run in first and second opposite directions alternatively when pushed by the first and second capstans; first and second reel shafts coupled to the second or first capstans when the magnetic tape is run by the first or second driving unit and designed to rotate in the direction in which the magnetic tape is taken up; and an intermediate pulley means for rotating the first and second reel shafts in the direction in which the magnetic tape is taken up; detecting means for detecting the time at which the magnetic tape is substantially fully taken up; reversion means for reversing the run of the magnetic tape alternatively, a reversion control unit for said reversion interlockingly with the detecting means; said reversion control unit comprising a rotated member provided with an engagement shaft belonging to the reversion means and a plurality of projection-bearing cams belonging to the magnetic head-vertically moving means, and at least two concave stop portions spaced from each other at a distance corresponding to a specified circumferential angle and normally brought to rest with one of the concave stop portions caused to face the rotation-initiating member; and an auxiliary rotated member provided with rotation-induction portions designed to be coupled to the rotation-initiating member by being rotated up to one of said concave stop portions through operation of the detecting means and further push the rotated member for engagement with the rotation-initiating member; and magnetic headvertically moving means for changing the operative height of the magnetic head in a plurality of steps interlockingly with the detecting means, thereby effecting continuous multi-channel type recording and reproduction by automatically reversing the run of the magnetic tape, each time it is substantially fully taken up.



4,101,942

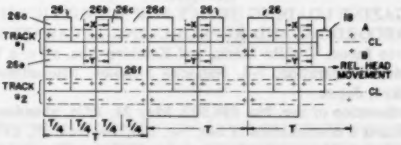
TRACK FOLLOWING SERVO SYSTEM AND TRACK FOLLOWING CODE

James O. Jacques, Tracy, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1976, Ser. No. 732,634

Int. Cl.[2] G11B *21/10*

U.S. Cl. 360—77 **24 Claims**



1. A data storage member comprising: a track; and a tracking code for positioning a transducer with respect to said track, said code including:
(a) a first path including a first region of magnetic flux of one polarity followed by a second region of magnetic flux of opposite polarity and preceded by a fifth region of magnetic flux of said opposite polarity; and
(b) a second path adjacent said first path and including a

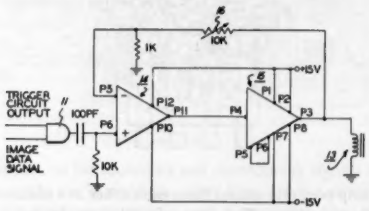
third region of magnetic flux of said opposite polarity followed by a fourth region of magnetic flux of said one polarity, wherein said second region follows said first region and said fourth region follows said third region at substantially the same positions on said storage member in their respective paths, and wherein the number of lines of flux in passing from said first region to said second region is equal to the number of lines of flux in passing from said third region to said fourth region, said third region and said fifth region commencing in their respective paths at substantially the same positions on the storage member.

4,101,943

CONTROLLED-WIDTH-SYNCHRONIZATION OF RECORDED PIXELS

Thomas M. Frey, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,283
Int. Cl.[2] G11B *5/52*
U.S. Cl. 360—84 **6 Claims**



1. Magnetic imaging apparatus for providing controlled-width-synchronization of recorded pixels, comprising:

(a) a rotational recording member having a record head mounted thereon;

(b) means for generating a first signal at a frequency which is a multiple of a predetermined recording frequency;

(c) means for generating a second signal indicative of the position of said record head during rotation of said rotational recording member;

(d) means for generating a third signal at the desired recording frequency, said means capable of initiating the generation of said third signal at the beginning of a time period division of a pixel recording time length upon receipt of said second signal and capable of terminating said generation of said third signal at a predetermined number of recorded pixels, the number of said time period divisions within a pixel recording time length being equal to the multiple of said first signal frequency with respect to said predetermined recording frequency; and

(e) means for driving said record head at the frequency of said third signal.

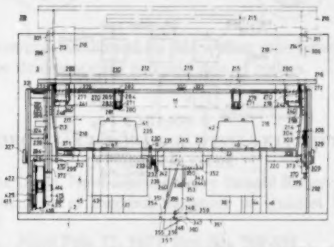
4,101,944

MAGAZINE LOADING DEVICE FOR MAGNETIC VIDEO RECORDING AND REPRODUCING APPARATUS

Makoto Inoue; Toshiki Ikeda, and Koichiro Abe, all c/o Teac Video Corporation, 7-3, Nakacho 3-chome, Musashino-shi, Tokyo, Japan

Continuation of Ser. No. 688,592, May 21, 1976, abandoned, which is a continuation of Ser. No. 525,754, Nov. 21, 1974, abandoned. This application Aug. 12, 1977, Ser. No. 824,164
Claims priority, application Japan, Nov. 24, 1973, 48-132392
Int. Cl.[2] G11B *15/66, 23/04, 5/52*
U.S. Cl. 360—85 **4 Claims**

1. A magnetic video recording and reproducing apparatus comprising a magazine loading section disposed on the main surface of a main chassis of said apparatus, a rotary magnetic head assembly composed of a cylindrical magnetic tape guide surface and a rotary magnetic head and disposed on the main surface of the main chassis, a magazine loading device for loading a magazine formed with a casing containing a magnetic tape onto said magazine loading section and unloading said magazine therefrom, and magnetic tape threading means for drawing out said magnetic tape from said magazine to thread it on the magnetic tape guide surface of said rotary magnetic head assembly, in which said magazine loading device is composed of at least a magazine holder for housing the magazine inserted thereinto from the front of said magazine holder, a magazine holder support mechanism for supporting said magazine holder and bringing it from a magazine housing and unhousing position where the magazine is inserted into and removed from the magazine holder to a magazine loading position where the magazine is loaded on said magazine loading section and bringing the magazine holder from said magazine loading position to said magazine housing and unhousing position, and a buffer mechanism for providing a buffer effect when the magazine holder is brought from the magazine housing and unhousing position to the magazine loading position in the case of the main chassis being positioned vertical; said magazine holder support mechanism has left and right support



plates planted on the main surface of the main chassis and first and second support arms pivoted to each of said left and right support plates, the free ends of said first support arms respectively pivoted to the left and right support plates being pivoted to the forward portions of said left and right side plates of the magazine holder on the outside thereof and the free ends of said second support arms pivoted to the left and right support plates being pivoted to the backward portions of the magazine holder on the outside thereof; and said buffer mechanism comprises a rotative lever pivotally mounted on the main chassis, a rotary member disposed to rotate with the rotation of the first support arm of said magazine holder support mechanism in the case of the main chassis being positioned with its main surface vertical, a brake ring mounted on the shaft of said rotative lever in a manner to be rotated through said rotary member and a uni-directional rotary coupling mecanism only when said first support arm rotates for bringing the magazine holder from the magazine loading position to the magazine housing and unhousing position, and a brake shoe mechanism for said brake ring.

4,101,945

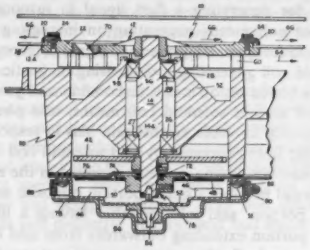
DRIVE SPINDLE ASSEMBLY FOR DISC FILE

Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Sep. 7, 1976, Ser. No. 721,042
Int. Cl.[2] G11B *17/32, 25/04*
U.S. Cl. 360—102 **24 Claims**

1. A disc-drive spindle assembly and means for mounting the same in a disc recorder, comprising in combination: a disc recorder frame, including means defining a pair of spaced bearing supports; a direct-coupled spindle assembly, including a spindle shaft, a motor with its rotor coupled directly to said spindle shaft, a mounting platform means attached to said spindle shaft for mounting a disc and rotating the same with said shaft and air-moving means driven by the spindle for forcing air along at least part of the spindle shaft to help cool

the shaft; at least two bearings encircling said shaft at mutually spaced locations, said bearings supported in position by said



spaced bearing supports of said recorder frame to thereby rotatably support the spindle assembly on said frame as a direct-coupled unit.

4,101,946

TAPE PLAYING MACHINE WITH MOVABLE HEAD MOUNT

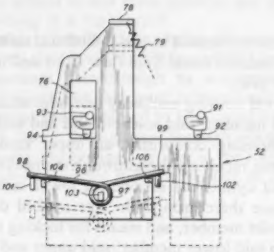
Ryoji Takamatsu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 26, 1976, Ser. No. 708,898

Claims priority, application Japan, Jul. 30, 1975, 50/106423[U]; Jul. 30, 1975, 50/106425[U]; Aug. 14, 1975, 50/112237[U]

Int. Cl.[2] G11B *5/54, 21/16*

U.S. Cl. 360—105 **9 Claims**



2. In a tape recording/reproducing apparatus comprising a chassis, a first actuating push bar, a second actuating push bar, a head deck mounted on said chassis for back and forth movement in first and second directions, spring means attached to said head deck at a generally central position and having first and second extending portions, said first actuating push bar engageable with said first extending portion and said second actuating push bar engageable with said second extending portion to move said head deck in a first direction, return spring means connected between said chassis and said head deck to move it in a second direction, and stop means for limiting the motion of said head deck in said first direction but allowing said first and second actuating push bars to continue movement after said head deck has engaged said stop.

4,101,947

NARROW TRACK MAGNETIC-HEAD RECORDER

David Noel Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

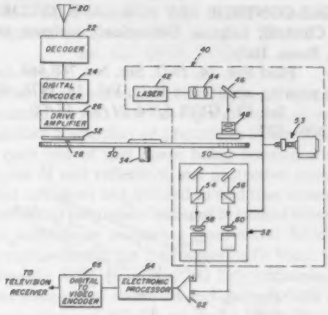
Filed Oct. 4, 1976, Ser. No. 729,553

Int. Cl.[2] G11B *5/32, 11/10*

U.S. Cl. 360—114 **14 Claims**

1. A process for magnetically recording an information signal on a planar magneto-optic medium of the type having a predominant proportion of magnetic domains in an orientation exhibiting a substantial magnetic component normal to a recording surface of said medium, the information signals being adapted to be reproduced by relatively high resolution optical playback apparatus employing a polarization detection beam oriented at a relatively steep angle to the recording surface, said process comprising:

moving a magnetic head, adapted to produce a magnetic field component normal to a recording surface, relative to the recording surface of such a medium along a predetermined track path, which, based on head width, incorporates a significant degree of track overlapping; and



applying the information signal to said magnetic head during such movement relative to the medium, such signal acting through said head to produce said magnetic field component normal to the surface in proportion to the signal to thereby induce domain orientation changes in the normal magnetic component of said medium, whereby the signal is recorded as orientations of magnetic domains in a narrow residual track portion and whereby the economy of magnetic recording is achieved in combination with the high information storage density of a magneto-optic storage medium.

4,101,948

METHOD FOR CLEANING FLEXIBLE MAGNETIC DISCS

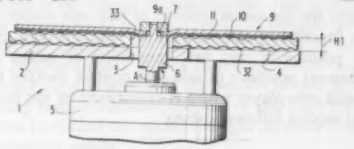
Eiichi Tadokoro, and Tatsuji Kitamoto, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 21, 1976, Ser. No. 753,165

Claims priority, application Japan, Dec. 29, 1975, 51-159260

Int. Cl.[2] B21B *45/02;* **G11B** *25/04*

U.S. Cl. 360—137 **16 Claims**



1. A cleaning method for a recording and reproducing apparatus of the type having a flat, horizontal base plate having a central aperture therein, a drive motor mounted beneath the base plate and having a rotary spindle extending up through the aperture, and a flexible record disc secured to the spindle for levitating rotation thereby parallel to and above the base plate, the record disc having a magnetic layer thereon on the side opposing the base plate, said method for cleaning the magnetic layer comprising:

(a) disposing a soft, coarse, and porous sheet member on the base plate below the record disc, the sheet member having

a central aperture therein corresponding to the base plate aperture

(b) adhering the sheet member to the base plate,

(c) rotating the record disc at a speed below its levitation speed, whereby the magnetic layer is slidingly contacted by the sheet member and cleaned thereby, dust particles adhering to the magnetic layer being scraped off by and transferred to the sheet member, and

(d) removing the sheet member prior to recording or reproducing information on or from said disc.

4,101,949

SINGLE CONTROL KEY FOR TAPE RECORDERS

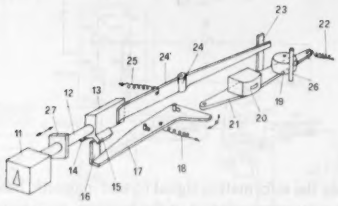
Rodolfo Cicatelli, Lugano, Switzerland, assignor to Autovox S.p.A., Rome, Italy

Filed Feb. 14, 1977, Ser. No. 768,468

Claims priority, application Italy, Feb. 16, 1976, 48110 A/76

Int. Cl.[2] G11B *5/54, 21/22, 15/00*

U.S. Cl. 360—137 **10 Claims**



1. In tape recorders having a frame, a tape drive variator (controller), and a movable support mounting at least one of a pressure roller and magnetic head on the frame, a single control key comprising:

a shaft rotable about its axis;

an outer body fixed to said shaft for manually rotating said shaft;

a cam means fixed to said shaft, said cam means having a substantially rectangular cross section about said shaft axis in a plane perpendicular to said shaft axis;

projecting tabs connected to and rotatable with said shaft and spaced apart through a substantial angle of rotation of said shaft;

first cam follower means located adjacent to and coacting with said cam means for being positioned in response to the rotational position of said cam means; and

second follower means having a portion located radially between and coacting with said projecting tabs for being positioned in response to the rotational position of said tabs;

whereby the rotational position of said cam means controls one function of said tape player which is determined by the position of said first cam follower means and the rotational positions of said tabs control another function of said tape player which is determined by the position of said second follower means.

4,101,950

PORTABLE FLUID TRANSFER PUMP

Donald L. Hager, Elmira; Ralph V. Brown, Cayuta, and James A. Thomas, Corning, all of N.Y., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed Nov. 8, 1976, Ser. No. 739,402

Int. Cl.[2] H01H *47/32*

U.S. Cl. 361—203 **16 Claims**

1. A portable fluid transfer pump comprising:

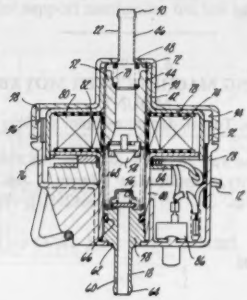
a cylindrical member having a guide portion at one end and a contiguous necked down portion at the other end, said necked down portion forming an outlet port;

solenoid coil means disposed concentrically about the outside of said guide portion for generating a magnetic field in response to a current flow;

detection coil means magnetically linked to said solenoid means for generating a first signal in response to said solenoid coil means generating an increasing magnetic field, and for generating a second signal in response to said solenoid coil generating a decreasing magnetic field;

resiliently biased piston means disposed in said guide portion adjacent to said solenoid coil means, said piston means reciprocally movable against said bias in response to the magnetic field generated by said solenoid coil means;

an inlet member having one end received in the end of said cylindrical member's guide portion opposite said necked down portion, said inlet member having a like necked down portion extending outwardly from said cylindrical member, and a fluid passageway passing through said inlet member concentric with said like necked down portion, said fluid passageway forming an inlet port;



valve means disposed in said cylindrical member for providing a unidirectional fluid flow from said inlet port to said outlet port;

an external housing enclosing said inlet member, said cylindrical member, said solenoid coil and said detection coil, said housing comprising an upper member having an aperture receiving therethrough the necked down portion of said cylindrical member, a lower member having an aperture therethrough the like necked down portion of said inlet member, and means for locking said upper member to said lower member, said upper and lower members in their locked state securing said inlet member in said cylindrical member; and

a blocking oscillator having an electronic switch member for controlling the current flow through said solenoid coil in response to said first and said second signals generated by said detection coil.

4,101,951

VARIABLE CAPACITOR

Saburo Kuze, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,372

Claims priority, application Japan, Jul. 28, 1975, 50-104912[U]; Apr. 16, 1976, 51-48273[U]

Int. Cl.[2] H01G *5/04*

U.S. Cl. 361—293 **13 Claims**

1. A variable capacitor for use in electrical and electronic equipment comprising:

a substantially circular disc-like stator member of electrically insulating plastic material to which a stator electrode is secured thereto, said stator electrode including a stator terminal end and a stator terminal lead which form a single monolithic element;

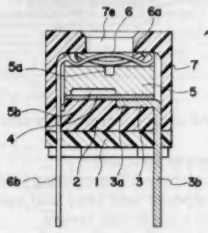
a rotor member of electrically conductive material including one surface which mates with and is rotatably disposed on

a dielectric member, said dielectric member being positioned adjacent to said stator member;

said one surface of said rotor member including a cut out portion acting as a rotor electrode for alteration of electrostatic capacity upon rotation of said rotor member through variation of confronting areas between said rotor member and said stator electrode;

said dielectric member being a plate member of dielectric ceramic material separately formed and disposed between said rotor member and said stator electrode;

a contact member including a rotor terminal end and a rotor terminal lead which form a single monolithic element, said contact member being positioned adjacent said rotor member and being adapted to urge said rotor member towards said dielectric member and said stator member;



said stator member, stator electrode, dielectric member, rotor member and contact member being housed in a substantially cylindrical casing of electrically insulating plastic material except for said stator terminal end and said rotor terminal end, said substantially cylindrical casing being firmly affixed to said stator member and including a through opening in a top thereof;

said substantially cylindrical casing being closed at a bottom thereof by an electrically insulating plastic base which includes openings therethrough to accommodate said stator terminal end and said rotor terminal end; and

said rotor member being adapted to be rotated by inserting an adjusting means through said through opening in the top of said casing to engage a groove in the rotor member which includes a marking for identification of directional property.

4,101,952

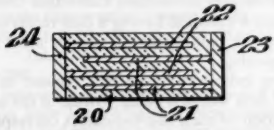
MONOLITHIC BASE-METAL GLASS-CERAMIC CAPACITOR

Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 17, 1976, Ser. No. 715,036

Int. Cl.[2] H01G *1/01, 4/08*

U.S. Cl. 361—305 **21 Claims**



1. A monolithic ceramic capacitor comprising: a reduction resistant glass-ceramic body having at room temperature a dielectric constant greater than 1000 and having a characteristic sintering and full densification temperature of from 1080° C to 950° C, said body consisting of from 5 to 15% by weight of a non-crystalline glass phase and from 85 to 95 percent by weight of a crystalline ceramic phase having a characteristic sintering and densification temperature greater than about 1200° C, said glass phase consisting essentially of an alkaline earth aluminoborate glass wherein said alkaline earth is selected from barium, strontium and calcium, said crystalline phase being an alkaline earth metal titanate wherein at least 50 mole percent of said alkaline earth metal is barium; a base metal electrode being buried within said reduction resistant glass-ceramic body; and another metal electrode contacting said body and being in capacitive relationship with said buried electrode.

4,101,953

MULTIPLE FLASHLAMP ARRAY

Robert M. Anderson, Pepper Pike, and James M. Hanson, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 506,953, Sep. 18, 1974, abandoned. This application Feb. 3, 1977, Ser. No. 765,455

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—11 **4 Claims**

1. A multilamp photoflash array comprising a base, a reflector unit mounted on said base having a plurality of outwardly facing reflectors, a plurality of photoflash lamps mounted on said base, each one of said lamps being positioned within a respective one of said reflectors, and protective cover means over the said reflectors and secured to said base constituted of a light-transmitting polymodal resinous branched block butadiene styrene copolymer containing from about 70–95 weight percent styrene, wherein the copolymer has a Vicat softening of approximately 200° F, a 90–95% light-transmission, and Izod impact strength of about 0.4 foot-pounds/inch notch, a modulus of elasticity of 200,000 psi, and a 100% elongation at a tensile pull rate of approximately 0.2 inches/minute.

4,101,954

DEVICE FOR VARIABLY ILLUMINATING AN OBJECT

Karl Heinz, Rietmüller, Frankfurt, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Jun. 3, 1977, Ser. No. 803,262

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 7618804[U]

Int. Cl.[2] G01D *11/28*

U.S. Cl. 362—26 **11 Claims**

1. A device for variably illuminating an object comprising a light source;

light conducting means adapted to transmit light to the object to be illuminated and having an end for receiving light from said light source;

light control means disposed between said light source and said end of said light conducting means including a movable member constructed of light conductive material receiving light from said light source and having a light transmitting surface of varying dimensions along the direction of movement of said member, said light transmitting surface being movably disposed adjacent said end of said light conducting means, the movement of said member relative to said end of said light conducting means varying the dimensions of the portion of said light transmitting surface adjacent said end of said light conducting means to control the amount of light supplied to said light conducting means.

4,101,955

ORNAMENTAL ARTICLE WITH ILLUMINATED DISPLAY

Richard E. DuNah, Mountain View, Calif., assignor to Precision Lamp, Mountain View, Calif.

Filed Oct. 12, 1976, Ser. No. 731,122

Int. Cl.[2] F21L *15/08*

U.S. Cl. 362—104 **11 Claims**

7. An illuminated ornamental article, comprising an outer case having a front and rear surface, said outer case section containing a lens chamber therein, an aperture in said front surface in communication with said lens chamber, a lens hav-

ing a front surface and a convex rear surface disposed in said chamber with the front surface in said aperture, a light source receiving well extending into said lens from the convex rear

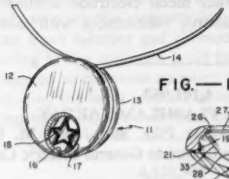


FIG. — 1

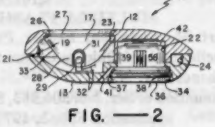


FIG. — 2

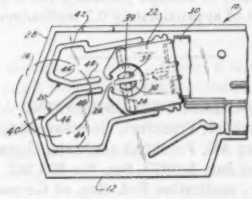
surface, a miniature light source in said well operating to emit light to be transmitted through said lens to the front surface when said miniature light source is energized to thereby illuminate the front surface.

4,101,956

FLUORESCENT FIXTURE

Roy B. Crane, Wilmington, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,482
Int. Cl.[2] H05B *33/02*; H01R *33/08*
U.S. Cl. 362—217 **1 Claim**



1. In a fluorescent light fixture of the type including a housing having a pair of sockets positioned at opposite ends thereof for engagement with the pins of a fluorescent lamp, said sockets each having surfaces defining a cutout center portion, an opening extending through ends of said sockets communicating with said cutout for receiving said pins, contacts for electrical connection with said pins mounted in said cutout and surfaces of said socket for mechanical interengagement with said pins to secure said lamp in position, the improvement comprising: guide means affixed to said housing positioned in front of said socket opening to direct said lamp pins through said socket opening to siad cutout and into position to be rotated into electrical engagement with said contacts and mechanical interengagement with said surfaces; said guide means comprises a pair of members each including first portions thereof having surfaces spaced apart from each other and converging toward said socket opening and second portions thereof positioned between said first portions and socket opening and having surfaces parallel to each other and spaced apart a distance substantially equal to that of said opening; and, said sockets are mounted to end caps at opposite ends of said housing and said guide means are formed integrally with the internal surfaces of said end caps.

4,101,957

ZOOM OPERATING LIGHT

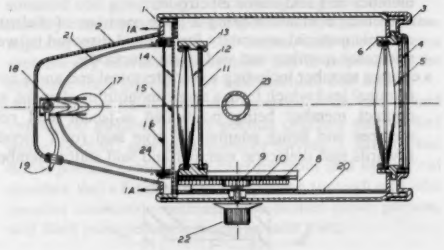
Bansun Chang, 12010 Susan Dr., Granada Hills, Calif. 91344

Filed Sep. 10, 1976, Ser. No. 722,220
Int. Cl.[2] A61B *1/06*
U.S. Cl. 362—268 **4 Claims**

1. A zoom operating lamp useful for illuminating the oral cavity during dental and medical surgery, said lamp combination comprising:

a lamp providing a light source having a uniform beam of light;

an ellipsoidal reflector having an inner focus and an outer focus, wherein said lamp is positioned at said inner focus thereof;



an iris positioned at the outer focus of said ellipsoidal reflector;

a movable biconvex lens; and

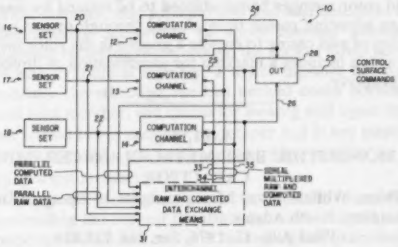
a fixed biconvex lens, said lenses being positioned on the side of said iris opposite said lamp and said reflector which together form a zoom-lens system.

4,101,958

APPARATUS AND METHOD FOR EFFECTING REDUNDANT CONTROL DATA TRANSFER IN A DIGITAL FLIGHT CONTROL SYSTEM

Robert A. Patterson, Marion, and Larry D. Lacy, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 1, 1977, Ser. No. 829,757
Int. Cl.[2] G06F *15/50, 3/00, 11/08*
U.S. Cl. 364—200 **18 Claims**



1. A method for transferring selected data words from one computation channel to another, redundant channel, each of said computation channels having a data receiving main memory into which the data words are written under the control of a CPU, comprising:

(a) entering indicators into a first register as each of said selected data words is being written in the main memory, the location of each said indicators corresponding to the address in the main memory where a data word is being written;

(b) while said CPU is operating, scanning the first register until an indicator is found;

(c) stealing one memory cycle and transferring into a second register the data from the main memory location corresponding to the location of the indicator found;

(d) thereafter serially clocking the data from the second register to a data receiver associated with the other redundant channel;

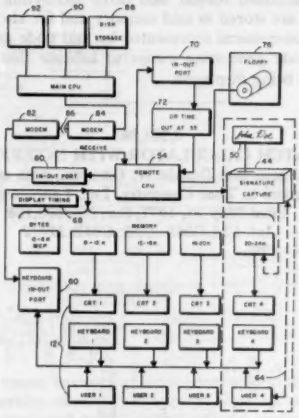
(e) removing said indicator found from said first register; and

(f) repeating steps (a) through (e).

4,101,959
TERMINAL DISPLAY AND STORAGE SYSTEM

Donald A. Domike, Encino; Bryon M. Cole, Venice, and Richard A. Matthews, Los Angeles, all of Calif., assignors to Informer, Inc., Los Angeles, Calif.

Filed Oct. 22, 1976, Ser. No. 735,061
Int. Cl.[2] G06F *3/04, 3/14*
U.S. Cl. 364—200 17 Claims



1. A system for recording, storing and later displaying document information including means for capturing and recording a given document, storing the captured information and displaying the captured information at a CRT terminal in a remote location from said storage location comprising:

at least one television camera;

means for providing a document to be viewed by said television camera for capture and storage;

a CRT for later displaying the document captured by said television camera;

a processor connected to said television camera for controlling and activating said television camera and formatting the picture provided by said document into digital information;

means to activate said processor;

a main central processing unit (CPU) for connection to said processor; and,

storage means connected to said main CPU for storing the digitized video information corresponding to the document that has been captured by said television camera.

4,101,960
SCIENTIFIC PROCESSOR

Richard Arthur Stokes, West Chester; David Jerome Kuck, Seymour, and Carl Anton Jensen, Malvern, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 29, 1977, Ser. No. 782,374
Int. Cl.[2] G06F *15/16, 15/20*
U.S. Cl. 364—200 9 Claims

1. A single instruction multiple data processor comprising:

a large scale high level language programmable general purpose front end processor for user interfacing, archival storage and scalar task processing;

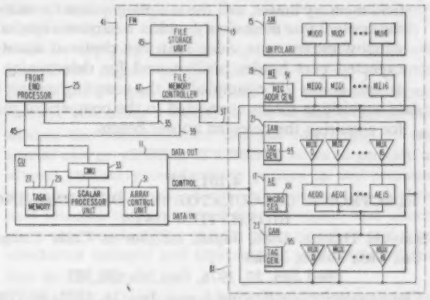
a parallel array processor having a parallel memory module array, a parallel array of arithmetic elements and an alignment network for aligning particular memory modules in said array thereof with particular arithmetic elements in said array thereof for parallel processing of linear vectors;

a large high speed secondary storage system having a high speed data channel connected to said front end processor and a high speed data channel connected to said parallel memory array; and

a control unit interconnected to said front end processor, said high speed secondary storage system and said parallel array processor for controlling said parallel array processor, said control unit comprising

a task memory for storing object program code for use in parallel processing;

a scalar processing unit for fetching object program code from said task memory and for issuing instructions in response thereto;



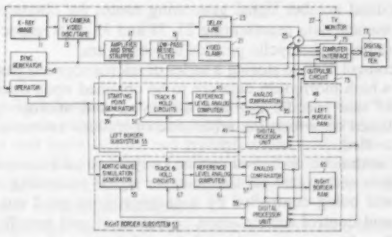
an array control unit for controlling said parallel task processor in response to instructions issued by said scalar processor; and

a control maintenance unit for providing communications between said front end processor and said control unit, for providing initialization and maintenance control for said control unit, and for gathering error and use data from said control unit, said secondary storage system, and said parallel array processor and for communicating gathered error and use data to said front end processor.

4,101,961
CONTOUR DETECTOR AND DATA ACQUISITION SYSTEM FOR THE LEFT VENTRICULAR OUTLINE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Johan H. C. Reiber, Papendrecht, Netherlands

Filed Feb. 16, 1977, Ser. No. 769,148
Int. Cl.[2] A61B *1/04;* H04N *7/02;* G06F *15/42*
U.S. Cl. 364—417 8 Claims



1. A real-time contour detector and data acquisition system for an angiographic apparatus having video scan means for converting X-ray images of a cardiac chamber characterized by a change in brightness level compared with its surrounding into video format and displaying the X-ray images in recurring video fields and comprising:

sampling means adapted to be coupled to the video scan means for sampling the brightness level of predetermined sample points of the current video field in the region of the last detected border point;

reference level means connected to the sampling means and responsive to the sampling of the brightness level of the

predetermined sample points for generating a reference brightness level at which the next border point can be detected;

comparator means connected to the reference level means for comparing the brightness level along a video scan line in the current video field with that of the reference brightness level to detect the next border point;

field memory means for storing the coordinates of detected border points from two preceding video fields;

processor means connected to the comparator means, the field memory means, and the sampling means for enabling the comparator means only within a narrow expectation window on the next video scan line centered about the expected next border position and for determining the sample points to be sampled by the sampling means; and

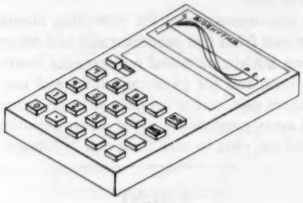
data acquisition means connected to the comparator means for acquiring the detected border points.

4,101,962

ELECTRONIC CALCULATOR FOR DETERMINING BIORHYTHM DATA

Masayuki Hakata, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1976, Ser. No. 698,507
Claims priority, application Japan, Jun. 24, 1975, 50-77866
Int. Cl.[2] G06F *15/02, 15/42*
U.S. Cl. 364—413 **20 Claims**



1. Non-programmable electronic calculator for determining biorhythm data, comprising:

an input section comprising a plurality of number keys for supplying data necessary to effect calculations based on the four fundamental rules of arithmetic and calendar data on the year, month and day; and function keys for instructing various arithmetic operations, including a specific key for instructing the determination of biorhythm;

cardinal number signal generating means for obtaining numerical data representing 23, 28 and 33 days respectively defining the cyclic periods of biorhythm;

a control section storing a series of microprograms based on which biorhythm data are to be obtained upon operation of said specific key and displayed, and microprograms based on which the arithmetic operations are to be controlled;

an arithmetic operation section coupled to said control section and to said cardinal number signal generating means and being controlled by a microprogram read out from said control section upon operation of said specific key, for obtaining a number of days of existence based on the calendar data on birthday and a specific date of biorhythm on which is to be determined, and for dividing said days of existence by the prescribed 23, 28 and 33 days so as to determine a number of residual days (including zero) which serves as biorhythm data, said calendar data having been supplied by operation of said number keys;

a memory for storing data items corresponding to the three factors of biorhythm, i.e., physique, sensitivity and intellect, in the form of numerical data showing the specific day in each cyclic period on which the three factors of biorhythm are applied;

code generating means for generating a code inherent to biorhythm, on the basis of a judgment made as to whether three biorhythm data factors stored in said memory exist on two regions, positive and negative, or on two points corresponding to two transition dates, one transition date from the positive region to the negative region and the other transition date from the negative region to the positive region, said code representing other than a numeral; and

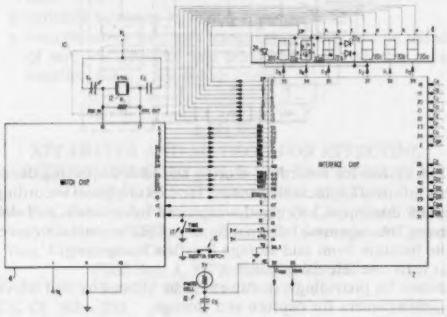
a display section coupled to said memory for displaying in a predetermined format said three biorhythm data items which are stored in said memory and for also displaying said non-numeral represented by said code generated by said code generating means to indicate that biorhythm data is being displayed.

4,101,963

WRISTWATCH CALCULATOR WITH INTERFACE CHIP

Robert O. Reese, and Donald W. Garrison, both of Lancaster, Pa., assignors to Time Computer, Inc., Lancaster, Pa.

Filed May 25, 1977, Ser. No. 800,158
Int. Cl.[2] G06F *7/38;* **G04B** *37/12*
U.S. Cl. 364—705 **9 Claims**



1. A wristwatch having a case in which are mounted a clock chip, a calculator chip, a plurality of electro-optical display stations, a manually operated time display mode switch connected to said clock chip for coupling said clock chip to said display stations, a plurality of manually operated keyboard switches, including a calculator display mode switch, mounted in said case and connected to said calculator chip for alternatively coupling said calculator chip to said display stations, an interface chip having inputs connected to outputs of the clock and calculator chips and outputs connected to the display stations, said interface chip containing substantially all of the circuits necessary to multiplex the clock and calculator outputs to display the desired output as commanded by the time display mode and calculator mode switches, and an inertia switch in said case and connected to said interface chip, said interface chip having means for detecting a predetermined pattern of movement of said inertia switch and for generating a time demand signal upon detection of said predetermined pattern of movement to select the watch display mode, whereby time is displayed at said display stations.

4,101,964

DIGITAL FILTER FOR PULSE CODE MODULATION SIGNALS

William L. Betts, St. Petersburg, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

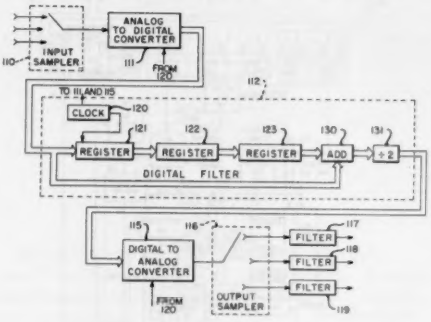
Filed Jan. 8, 1976, Ser. No. 647,537
Int. Cl.[2] G06F *7/38, 15/34*
U.S. Cl. 364—724 **1 Claim**

1. A digital filter for filtering a plurality of pulse code modulation signals appearing on separate input lines comprising:

sampling means for sampling each said input line in succession;

analog to digital means for sequentially converting the samples from said sampling means into digital form;

a plurality of serially connected single stage registers wherein the number of registers is equal to the number of said input lines, having the input to said plurality of serially connected registers connected to the output of said analog to digital means;



an adder means having one input connected to the output of said plurality of serially connected registers and a second input connected to the output of said analog to digital means for adding successive samples from a common one of said input lines and for adding samples from a different one of said input lines in succession;

a dividing means responsive to the output from said adder for averaging the output from said adder by dividing said adder output by two; and

digital to analog means for converting the averaged signal from said divider into analog form.

4,101,965

SURFACE ACOUSTIC WAVE DEVICES FOR PROCESSING AND STORING SIGNALS

Kjell A. Ingebrigtsen, Trondheim, Norway; Abraham Bers, Arlington, and John H. Cafarella, Swampscott, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 27, 1976, Ser. No. 690,601
Int. Cl.[2] G06G 7/19; H04R 17/00
U.S. Cl. 364—821 **14 Claims**

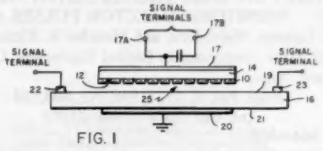


FIG. 1

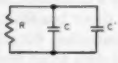


FIG. 3

1. A device for processing and storing signals comprising

a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof;

at least one transducer means formed on said selected surface for generating surface acoustic waves traveling on said surface along a selected direction thereof in response to electrical signals;

a semiconductor material positioned so as to have a first surface thereof, having a selected surface resistivity, adjacent and spaced from said selected surface of said first substrate to form an interaction region which includes the region at or near said surfaces and the spatial region therebetween;

an array of diode elements disposed at said first surface;

a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;

means for providing a first signal at said at least one transducer means to produce a first traveling acoustic wave signal along said selected surface of said first subtrate;

means for applying a second signal uniformly over said interaction region to provide time-varying properties thereof for the interaction of said first and second signals thereby producing a spatial charge variation among said diodes, the semiconductor material responding to said spatial charge variation in a manner so as to provide an altered stationary conductivity pattern in said semiconductor material as said acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing said interacted first and second signals; and

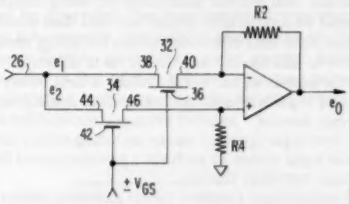
means capable of providing a third signal for interactionwith said altered stationary conductivity pattern, the selected surface resistivity of said semiconductor material being sufficiently high that such interaction can produce a usable interaction output signal.

4,101,966

4-QUADRANT MULTIPLIER

Vasil Uzunoglu, Ellicott City, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Mar. 28, 1977, Ser. No. 782,127
Int. Cl.[2] G06G 7/163
U.S. Cl. 364—841 **6 Claims**



1. A high frequency 4-quadrant multiplier for receiving two input signals and providing an output proportional to the product of said input signals, and multiplier comprising:

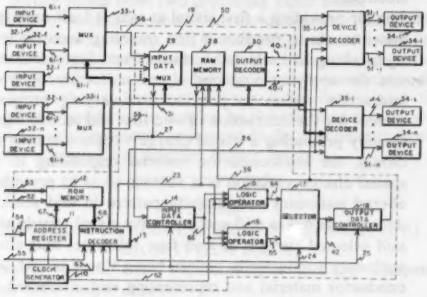
an operational amplifier having first and second input terminals and an output terminal for providing the output of said 4-quadrant multiplier;

variable first and second resistance elements each having an input terminal, an output terminal and a control terminal, the input terminals of said resistance elements being coupled together for receiving a common input signal and the control terminals of each said resistance element being coupled together for receiving a common control signal, the resistance between the input and output terminals of each said resistance element varying in response to said common control signal, the output terminals of said variable first and second resistance elements being coupled to the first and second operational amplifier input terminals, respectively, said common input signal and said common control signal forming the input signals to said 4-quadrant multiplier.

4,101,967
SINGLE BIT LOGIC MICROPROCESSOR

Marian Stanislaw Hajduk, Whitestone, N.Y., assignor to Tendy Electronics Co., New York, N.Y.

Filed May 19, 1976, Ser. No. 687,867
Int. Cl.[2] G06F *7/00, 7/38*
U.S. Cl. 364—900 **9 Claims**



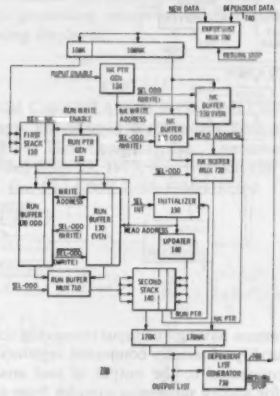
1. A logic microprocessor comprising in combination:
a single serially fed input data controller means having a data input, a control input, and a single data output;
first and second logic operator means each having a respective single data input commonly coupled to said single data output of said input data controller means and each being fed the same serial data thereby and a single data output;
data selector means having a pair of data inputs respectively coupled to the single data output of said first and second logic operator means, a control input and a data output;
an instruction word memory, means for accessing instruction words from said memory, and a decoder responsive to said instruction words for providing a control signal output comprised of at least first and second instruction bits, said first instruction bit being coupled to said first and second logic operator means for enabling said operator means, said second instruction bit being coupled to said input data controller means and said data selector means; said input data controller means including means responsive to said second instruction bit to selectively provide a data output signal having either a first (true) or second (not) logic value of the input data applied to said data input thereof;
said first logic operator means including means set by one of said logic values to perform a predetermined first type of logic operation thereon,
said second logic operator means including means set by one of said logic values to perform a predetermined second type of logic operation thereon, and
said data selector means including means responsive to said second instruction bit to provide a data output signal at its data output selectively either the output of said first logic operator means or the output of said second logic operator means.

4,101,968
SORTER WITH OVERLAP OPERATION

Judit Katalin Florence, Menlo Park, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,221
Int. Cl.[2] G06F *7/24*
U.S. Cl. 364—900 **15 Claims**

1. A two stage sorter which receives dependent sequential scan line lists each having N or less initial data items, and sorts the data items according to one position coordinate thereof to form raster scan lines of ordered data for displaying edges of polygon faces on a raster scan display device in which thhe direction of scan is parallel to the one position coordinate, the two stage sorter comprising:
means for grouping the N or less data items of each scan line list into Q groups of data items;
a first stage sorter means for numerically ordering the data items within each of the Q groups according to the one position coordinate;
interstage storage means for holding the Q groups of ordered data items;
a second stage sorter means for forming a single ordered scan line list of all of the N or less data items, by receiving



from the interstage storage means and sorting the first data item of each group, and then continuously outputting the first data item in the second sorter and receiving and sorting the next data item from the same group as the previously outputted data item; and
dependent item means responsive to the N or less data items in the single order scan line list from the second sorter means for providing dependent data items and forwarding the dependent data items to the means for grouping to be sorted into a subsequent scan line list.

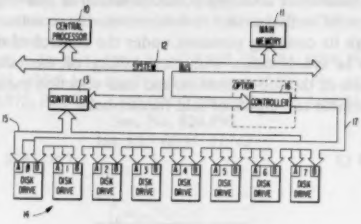
4,101,969
SECONDARY STORAGE FACILITY WITH MEANS FOR MONITORING SECTOR PULSES

Roger E. Lawson, Northboro, and Maurice A. Richesson, Stow, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 6, 1977, Ser. No. 803,524
Int. Cl.[2] G06F *11/06, 13/04*
U.S. Cl. 364—900 **4 Claims**

1. A drive for use in a secondary storage facility that includes a controller for controlling the operation of said drive and a drive bus for conveying signals between said drive and the controller, the controller including means for transferring digital data to an from said drive, said drive comprising:
A. a storage medium having data and timing information stored thereon,
B. sector pulse means for generating a sector pulse corresponding to each sector in response to the timing information on said medium,
C. transmitter means responsive to said sector pulse means for transmitting onto a sector line of the drive bus a sector pulse signal that is conveyed over the drive bus to the controller,
D. testing means connected to said sector pulse means and to

the drive bus for generating a MULTIPLE DRIVE SELECTED signal when a signal appears on the sector line



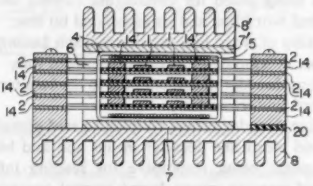
of the drive bus that is transmitted at a time other than the transmission of a signal by said transmitter means.

4,101,970

MAGNETIC BUBBLE MODULE

Nobuo Saito, Mitaka; Shigeru Yoshizawa, Tokorozawa, and Takashi Toyooka, Tokyo, all of Japan, assignors to President of Kogyo Gijutsuin, Japan

Filed Jul. 8, 1976, Ser. No. 703,604
Claims priority, application Japan, Jul. 8, 1975, 50-83092
Int. Cl.² G11C *19/08*
U.S. Cl. 365—2 **7 Claims**



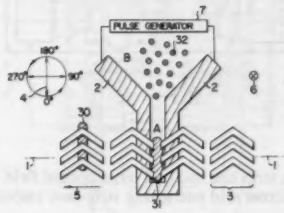
1. A magnetic bubble module comprising at least one substrate including therein at least one metal foil having a thickness smaller than a skin depth of said metal, said substrate serving also as a heat transfer plate; at least one magnetic bubble chip arranged on said substrate; and driving coils enclosing said chip therein for generating a rotating magnetic field, wherein said substrate extends from the inside to the outside of said coils.

4,101,971

MAGNETIC BUBBLE INFORMATION WRITING DEVICE

Minoru Hiroshima; Shigeru Yoshizawa; Nobuo Saito; Atsushi Asano, and Hirokazu Aoki, all of Kokubunji, Japan, assignors to President of Kogyo Gijutsuin, Japan

Filed Aug. 24, 1976, Ser. No. 717,377
Claims priority, application Japan, Aug. 28, 1975, 50/103498; Nov. 4, 1975, 50/131446
Int. Cl.² G11C *19/08*
U.S. Cl. 365—11 **6 Claims**



5. In a magnetic bubble information writing device of the type including a thin film of magnetic substance having uniaxial anistropy; an insulating film disposed on said thin magnetic film; a magnetic bubble propagation circuit made of soft magnetic substance and disposed on said insulating film; a conductor loop so disposed between said thin magnetic film and said insulating film as to be opposite to a portion of said propagation circuit with said insulating film interposed therebetween; first means for applying to said thin film of magnetic substance having uniaxial anisotropy a dc bias magnetic field perpendicular to said thin film; second means for applying to said propagation circuit a rotating magnetic field parallel to said propagation circuit; and third means for applying to said conductor loop a magnetic bubble generating pulse current, wherein both information magnetic bubbles and unwanted stray magnetic bubbles may be generated, the improvement comprising said third means subsequently applying to said conductor loop a stray magnetic bubble annihilating pulse current having a polarity opposite to that of said bubble generating pulse current for annihilating said stray magnetic bubbles without affecting said information magnetic bubbles.

4,101,972

BUBBLE DOMAIN PROPAGATION USING OSCILLATING STRIPE DOMAINS

Stanley James Lins, Bloomington; Roger Edward Lund, Woodbury, and Marlin Marshall Hanson, Cologne, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,975
Int. Cl.² G11C *19/08*
U.S. Cl. 365—29 **4 Claims**

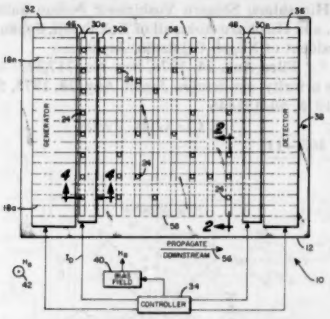
1. A method of propagating stripe domains, comprising:

orienting in a stripe domain layer a set of parallel stripe domains that are orthogonal to a propagation direction;

coupling in the plane of said stripe domain layer and parallel to said propagation direction a normal field H_Z having temporally succeeding cycles of a relatively small normal field amplitude gradient across an energizing strip line followed by a relatively large normal field amplitude gradient across said energizing strip line; and

oscillating said stripe domains between a maximum downstream position under said stripe line and a maximum

upstream position under said strip line when affected by said small normal field amplitude gradient across said



energizing strip line and said large normal field amplitude gradient across said energizing strip line, respectively.

4,101,973
RANDOM ACCESS MEMORY WITH VOLATILE DATA STORAGE

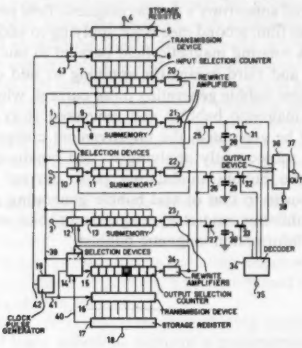
Hendrik Henricus Maria Tromp, Apeldoorn, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,856

Claims priority, application Netherlands, Nov. 3, 1975, 7512834

Int. Cl.² G11C *21/00*

U.S. Cl. 365—73 **5 Claims**



1. A random access memory, comprising a plurality of sub-memories, each having an input terminal, an output terminal and a plurality of cells for volatile information storage which are serially connected between said input and output terminals of each sub-memory, rewrite means connected to the output terminal of each sub-memory for recirculating and rewriting each said sub-memory output, output means coupled to each said sub-memory for receiving at least one rewritten information element per sub-memory when it appears on the output terminal of said sub-memery, selection means for producing a signal for selecting a predetermined sub-memory in order to supply an information element, from said sub-memory and through said output means, to an output of the random access memory, input means having an input which is connected to an input of the random access memory and an output which is connected to inputs of the sub-memories for storing modified information therein, clock pulse generator means for shifting the information elements serially and repeatedly through the sub-memory cells under the control of the clock pulses of the clock pulse generator means, a counter coupled to said clock pulse generator means, at least one further cell for volatile information storage coupled to the output of each sub-memory in order to receive rewritten information therefrom under the control of a counter position of the counter, said counter having a number of counting positions which at least equals the number of cells in each sub-memory, the counter passing through its counting positions under the control of the clock pulses in synchronism with the shifting of the information elements in the sub-memories, and said selection means being connectable to outputs of said further cells.

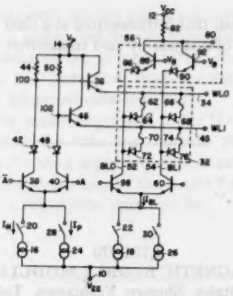
4,101,974
PERSONALIZABLE READ-ONLY MEMORY

Dennis L. Immer, Mesa; Michael S. Millhollan, Tempe, and Ronald L. Treadway, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 645,575, Dec. 31, 1975, abandoned. This application Sep. 30, 1977, Ser. No. 838,420

Int. Cl.² G11C *17/00*

U.S. Cl. 365—96 **4 Claims**



1. A personalizable read-only memory having a plurality of bit lines and word lines comprising:

(a) a plurality of interconnected cells, each cell comprising a fusible element and a unilaterally conducting device, each cell being coupled between an associated bit line and an associated word line, each of said unilaterally conducting devices being poled for conducting current between its associated word line and its associated bit line,

(b) a plurality of word line transistors, each having its emitter terminal coupled to a respective word line,

(c) word line decoder means coupled to the base terminals of said word line transistors,

(d) a bit line decoder means coupled to said plurality of bit lines, said word line decoder means and said bit line decoder means being responsive for reading information from said memory means during normal operation, and

(e) a first auxiliary current source coupled to said word line decoder means and being selectively disabled during normal operation, said first auxiliary current source being selectively coupled to said word line transistors during personalization for establishing a predetermined voltage differential between said plurality of word lines for selecting and isolating a predetermined fusible element prior to personalization thus eliminating the likelihood of erroneous personalization of other nonselected fusible elements.

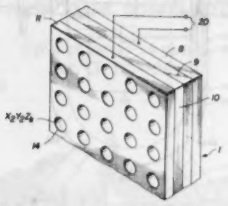
4,101,975
OPTICAL MEMORY WITH STORAGE IN THREE DIMENSIONS

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 533,365, Dec. 16, 1974, Pat. No. 4,051,465, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Aug. 15, 1977, Ser. No. 824,895

Int. Cl.[2] G11C *11/42*

U.S. Cl. 365—117 **12 Claims**



1. A three dimensional photovoltaic ferroelectric memory apparatus, comprising,

a plurality of electrically switchable stacked ferroelectric memory planes,

each memory plane including a layer of photovoltaic ferroelectric material and a layer of photoconductive material,

means for generating a light beam,

means for optically addressing selected storage *x-y* locations of the memory planes with said light beam, and

means for simultaneously electrically switching to a selected memory plane, whereby the selected *x-y* locations on the selected plane are accessed for writing and/or reading.

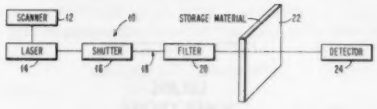
4,101,976
FREQUENCY SELECTIVE OPTICAL DATA STORAGE SYSTEM

George Castro; Dietrich Haarer, both of San Jose; Roger Morton MacFarlane, Palo Alto, all of Calif., and Hans Peter Trommsdorff, St. Martin d'Uriage, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,250

Int. Cl.[2] G11C *13/04*

U.S. Cl. 365—119 **13 Claims**



1. A frequency selective optical data storage system comprising:

a material, said material exhibiting inhomogeneous absorption line broadening and capable of storing at least two data bits in the frequency dimension, said material adapted to undergo a photo-induced reaction resulting in information stored in the non-volatile ground state of the material upon exposure to a light source having a wavelength bandwidth narrower than the inhomogeneous line width, and

a first laser adapted to write non-volatile information on said material with a wavelength narrower than and within the broad inhomogeneous absorption line.

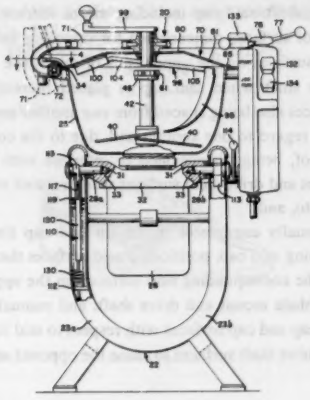
4,101,977
FOOD PROCESSING APPARATUS

Donald A. Brackman, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,461

Int. Cl.[2] B01F *7/16*

U.S. Cl. 366—246 **3 Claims**



1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, a cover system including a lid for closing the top of the bowl, a mixing baffle blade and support mounted in the lid for rotation along and around the inside surface of the bowl for removing and returning foodstuffs from the side of the bowl to the vicinity of the food processing blades for further processing thereby, and a handle system including a handle outside the lid and means operatively connecting the handle to the mixing baffle blade support to rotate the support and mixing baffle blade, the improvement comprising balance means including the handle system being sized and positioned for counterbalancing the mixing baffle blade and the mixing baffle blade support when the axis of rotation thereof is not vertical.

4,101,978
FOOD PROCESSING APPARATUS

Donald A. Brackman, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,457

Int. Cl.[2] B01F *7/16*

U.S. Cl. 366—314 **7 Claims**

1. A quickly operable manual wedge lock for securing and releasing food processing blades on the drive shaft of an apparatus for processing foodstuffs, the apparatus including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, and a cover system including a lid for closing the top of the bowl, the wedge lock comprising:

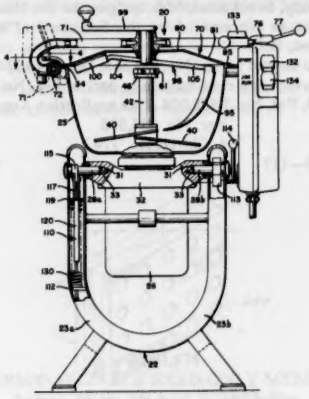
(a) a blade mount for driveably mounting the food processing blades on the drive shaft, said mount fitting over the drive shaft with a predetermined clearance between predetermined portions thereof and extending substantially to the upper end of the drive shaft within the bowl opposite the bottom of the bowl when located on the drive shaft,

(b) means on the upper ends of said blade mount and drive shaft opposite the bottom of the bowl defining a surface on

each, said surfaces being spaced from one another, eccentric with regard to one another, and substantially vertical, one surface being inside the other and the eccentricity therebetween being greater than said predetermined clearance between said blade mount and drive shaft,

(c) a cap placeable on the upper ends of said blade mount and drive shaft, said cap including means thereon defining a pair of surfaces dimensioned for opposing and engaging said surfaces on the upper ends of said blade mount and drive shaft when said cap is placed thereon, said cap surfaces also being spaced from one another and eccentric with regard to one another and, due to the eccentricities thereof, being dimensioned to interfere with said blade mount and drive shaft surfaces when rotated with respect thereto, and

(d) manually engageable means on said cap for manually grasping said cap, positioning said surfaces thereon opposite the corresponding said surfaces on the upper ends of said blade mount and drive shaft, and manually rotating said cap and cap surfaces with respect to said blade mount and drive shaft surfaces to cause the opposed said surfaces to move relative to one another into a wedged interference which jams said blade mount and drive shaft into



tight engagement with one another, thus securing said blade mount and the blades thereon onto the drive shaft.

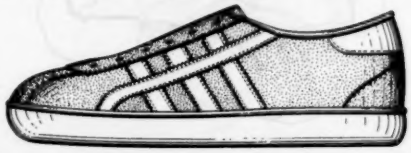
DESIGNS

JULY 18, 1978

248,511
SHOE
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima City, Japan
Continuation-in-part of Ser. No. 530,296, Dec. 6, 1974. This application Apr. 30, 1976, Ser. No. 681,912
Claims priority, application Japan, Nov. 1, 1974, 49-38440; Nov. 1, 1974, 49-38438; Nov. 8, 1974, 49-39273; Nov. 8, 1974, 49-39274
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—269

248,512
BOOT
Oscar Nova, and Renzo Nova, both of Legnano, Italy, assignors to Antonio Nova S.r.l., Legnano, Italy
Filed Dec. 17, 1976, Ser. No. 751,927
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

248,513
SPORT SHOE
Andres Navarro Soler, Poligono Industrial de Altabix, Elche (Alicante), Spain
Filed Jun. 23, 1976, Ser. No. 698,977
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

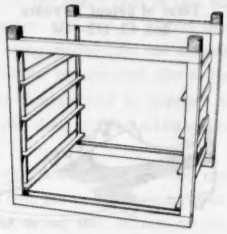


248,514
ATHLETIC SHOE
Wan Chan Lu, Miao Li Hsien, China, assignor to Jung Li Hsing Industry Co., Ltd., China
Filed Sep. 13, 1976, Ser. No. 722,372
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311

248,515
KEY HANGER
Robert T. Olson, Rt. #2, Box 452, Wisconsin Dells, Wis.
Filed Sep. 7, 1976, Ser. No. 720,956
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

248,516
INVERTIBLE CHAIR
Karl Hugo Johansson, 17582 Manchester Ave., Irvine, Calif. 92714
Filed Sep. 23, 1976, Ser. No. 725,986
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—3

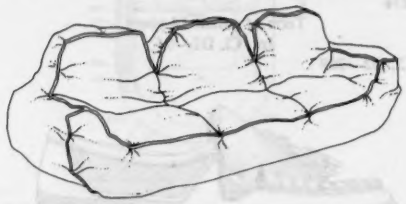
248,517
STAND FOR LETTER TRAYS
Ole Winther, Helsingör, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden
Filed Oct. 27, 1976, Ser. No. 736,052
Claims priority, application Sweden, May 5, 1976, 760991
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—3



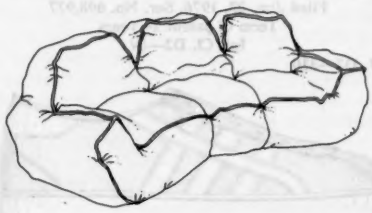
248,518
CHILD'S SWING
Edward F. Huff, 560 Trease Rd., Wadsworth, Ohio 44281
Filed Jan. 21, 1977, Ser. No. 761,400
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—10

248,519
STOOL
Lloyd J. Finch, 427 Fillmore, San Francisco, Calif. 94117
Filed Dec. 8, 1976, Ser. No. 748,799
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32

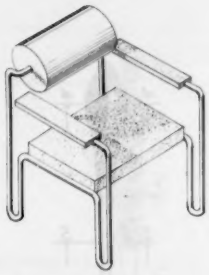
248,520
SOFA
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 7, 1976, Ser. No. 720,547
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



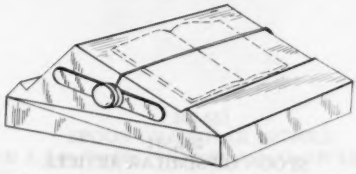
248,521
CURVED SOFA
Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sep. 7, 1976, Ser. No. 720,709
The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



248,522
CHAIR
Charles Richard Corda, 2310 National Dr., Brooklyn, N.Y. 11234
Filed Nov. 1, 1976, Ser. No. 737,831
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

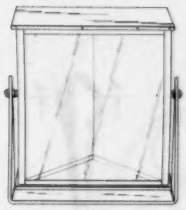


248,523
PORTABLE READING TABLE FOR BOOKS
Morton I. Goldstein, 5671 Saranac Dr., Columbus, Ohio 43227
Filed Aug. 5, 1976, Ser. No. 712,891
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184

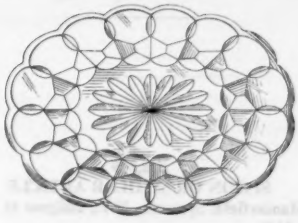


248,524
SEATING UNIT FOR A SWIVEL CHAIR
Gregory S. Gabourie, Ajax, Canada, assignor to Global Upholstery Company Limited
Filed Jun. 2, 1975, Ser. No. 582,875
The portion of the term of this patent subsequent to May 25, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197

248,525
MIRROR
David S. Eckel, and George S. Lechter, both of 22 Thorndike St., Boston, Mass. 02141
Filed Dec. 6, 1976, Ser. No. 747,982
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—237

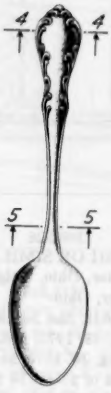


248,526
SERVING DISH OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 545,621, Jan. 30, 1975, which is a division of Ser. No. 397,069, Sep. 13, 1973, Pat. No. D. 238,541. This application Aug. 26, 1976, Ser. No. 718,042
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—1



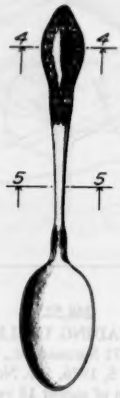
248,527
GLASS MUG
Charles S. Bryk, Tenafly, N.J., assignor to Texasgulf Inc., Stamford, Conn.
Filed Apr. 4, 1977, Ser. No. 784,428
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

248,528
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 8, 1976, Ser. No. 703,443
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

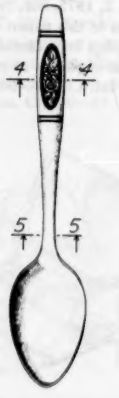


248,529
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 8, 1976, Ser. No. 703,444
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

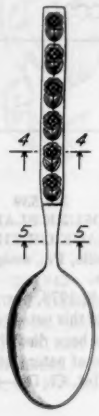
248,530
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 23, 1976, Ser. No. 708,034
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



248,531
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,474
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

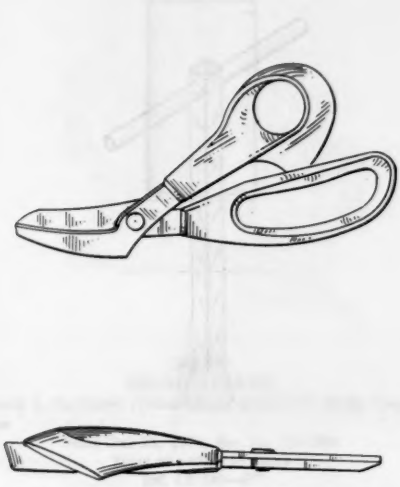


248,532
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 11, 1977, Ser. No. 758,506
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

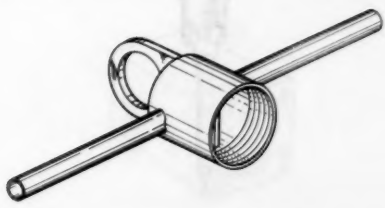


248,533
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,126
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—151

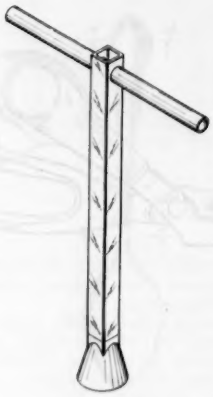
248,534
PRUNING-SHEARS
Olof Fredrik Bäckström, Koivuniemenkatu 33 D 31, SF-10600 Tammisaari, and Erkki Olavi Linden, Björkkulla, SF-10330 Billnäs, both of Finald
Filed Apr. 6, 1976, Ser. No. 674,249
Claims priority, application Finland, Oct. 13, 1975, 535/75
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—5



248,535
LIFTING AND HANDLING TOOL FOR ROTARY ROLLER BITS
Arne Sjöström, and Alf Svanström, both of Fagersta, Sweden, assignors to Fagersta Secoroc AB, Fagersta, Sweden
Filed Oct. 19, 1976, Ser. No. 733,932
Claims priority, application Sweden, Apr. 20, 1976, 76-0873
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

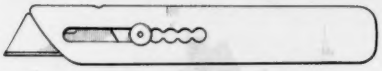


248,536
PLUMBING AND LANDSCAPING TOOL FOR INSTALLING AND REMOVING SPRINKLER HEADS
Richard Domasin, 2501 Hill Dr., Los Angeles, Calif. 90041
Filed Dec. 20, 1976, Ser. No. 757,064
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—21

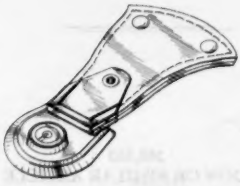


248,537
SCREWDRIVER
Lloyd T. Smith, Newton, Kans., assignor to S/V Tool Company, Inc., Newton, Kans.
Filed Jan. 5, 1977, Ser. No. 757,048
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—82

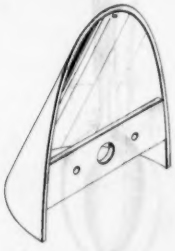
248,538
ADJUSTABLE BLADE KNIFE
James L. Richards, Rosemead, Calif., assignor to Pacific Handy Cutter, Inc., Costa Mesa, Calif.
Filed Sep. 30, 1976, Ser. No. 728,397
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



248,539
COMBINED CLOSURE FLAP AND LOCK FOR LUGGAGE OR THE LIKE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Oct. 8, 1975, Ser. No. 621,366
The portion of the term of this patent subsequent to Jan. 4, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—336



248,540
PADLOCK PROTECTOR
Peter J. Linder, 3109 Ramblewood Rd., Ellicott City, Md. 21043
Filed Apr. 8, 1976, Ser. No. 674,946
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—346



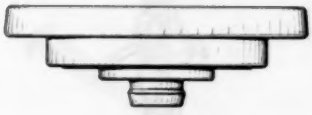
248,541
HOOK FOR HANGING MEAT
Gary R. Oberg, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Jan. 12, 1976, Ser. No. 648,203
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—372

248,542
BOTTLE DESIGN
Jack Z. Jacobs, 5833 N. 83rd St., Scottsdale, Ariz. 85253
Filed Oct. 26, 1976, Ser. No. 735,368
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—23

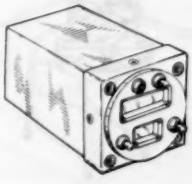
248,543
PACKAGING CONTAINER FOR A TAPE OR THE LIKE
Steven G. Strelcheck, Edgerton, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Jul. 26, 1976, Ser. No. 708,704
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—171

248,544
SEAM-FREE CAN
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed Oct. 22, 1975, Ser. No. 624,947
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

248,545
DRUM CLOSURE
Kenneth L. Summers, Hudson, Ind., assignor to Rieke Corporation
Filed Jul. 28, 1976, Ser. No. 709,380
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



248,546
AIRCRAFT CLOCK
Richard D. Snyder, 1136 Nottingham Way, Placentia, Calif. 92670
Filed Oct. 28, 1976, Ser. No. 736,431
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

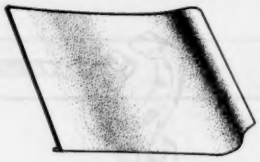


248,547
COMBINED WRIST WATCH CASE AND BAND
Fontana Fernando, Sesto Calende (Varese), Italy, assignor to Fontana Fernando S.p.A., Sesto Calende (Varese), Italy
Filed Jul. 22, 1976, Ser. No. 707,661
Claims priority, application Italy, Mar. 29, 1976, 21061
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

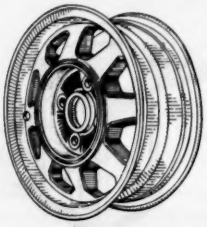
248,548
TENNIS PLAYER FIGURINE
Owen R. Siegel, 1517 Basswood Dr., Chicago, Ill. 60025
Filed May 10, 1976, Ser. No. 684,577
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

248,549
MEDICAL INSTRUMENT BASKET APPARATUS
Vincent G. Lopez, 10717 Santa Clara, Lamont, Calif. 93241
Filed May 24, 1976, Ser. No. 688,960
Term of patent 14 years
Int. Cl. D24—*01*; D12—*02*
U.S. Cl. D12—29

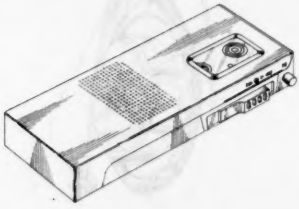
248,550
VEHICLE WIND DEFLECTOR
Boyd R. Woodard, 1085 NE. 89th St., Miami, Fla. 33138
Filed Feb. 11, 1977, Ser. No. 767,694
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



248,551
WHEEL
Iwae Sekido, and Sinichiro Doi, both of Nagoya, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha (Toyota Motor Co., Ltd.), Toyota, Japan
Filed Jun. 29, 1977, Ser. No. 811,365
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



248,552
MINIATURE DICTATING MACHINE
Werner Schulze-Bahr, Kassel, and Karl Weis, Bad Homburg, both of Fed. Rep. of Germany, assignors to Assmann G.m.b.H., Bad Homburg, Fed. Rep. of Germany
Filed Oct. 15, 1976, Ser. No. 732,811
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 1 MR 501
Term of patent 14 years
Int. Cl.[2] D14—*01*
U.S. Cl. D14—3



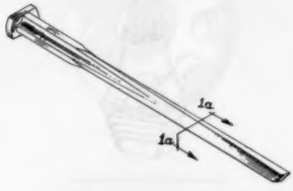
248,553
LOW CONSOLE TAPE DECK PLAYER
James F. Rebert, 3143 Pinehurst, and John W. Rebert, 1850 Burning Tree, both of Decatur, Ill. 62521
Filed Mar. 29, 1976, Ser. No. 671,167
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—5

248,554
DATA TERMINAL
Richard T. Hawkins, 1310 Winchester, Grandview, Mo. 64030
Filed Oct. 12, 1977, Ser. No. 841,550
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43

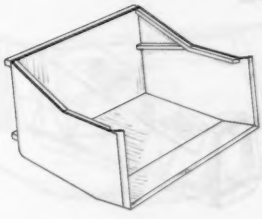
248,555
COMBINED SECURITY ACCESS GATE AND CONTROLLING CARD READER THEREFOR
Luigi Dibenedetto, El Segundo, Calif., assignor to TRW Data Systems, Hawthorne, Calif.
Filed Jun. 23, 1976, Ser. No. 699,151
Term of patent 14 years
Int. Cl. D14—*02*; D25—*99*
U.S. Cl. D14—49

248,556
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed Mar. 15, 1977, Ser. No. 777,616
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

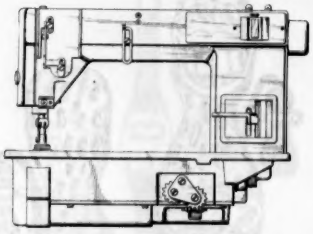
248,557
CUTTER PIN FOR MOWER
Donald L. Gobin, and Joseph E. Scanland, both of Savannah, Ga., assignors to Roper Corporation, Kankakee, Ill.
Filed Nov. 15, 1976, Ser. No. 741,992
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—17



248,558
TRACTOR PAN
Charles A. Absher, Rte. 1, Box 210-B, Traphill, N.C. 28685
Filed Jan. 21, 1977, Ser. No. 760,874
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—32

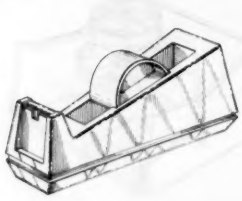


248,559
SEWING MACHINE
George Donald LaPolice, Somerville, N.J., assignor to The Singer Company
Filed Nov. 8, 1976, Ser. No. 739,752
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



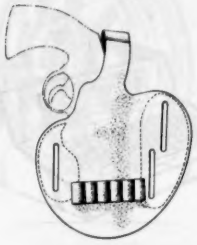
248,560
FELT PEN
Takaji Funahashi, No. 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed Jan. 4, 1977, Ser. No. 756,697
Claims priority, application Japan, Jul. 21, 1976, 51-28265
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—43

248,561
TAPE DISPENSER
Hartland W. Deering, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 10, 1977, Ser. No. 757,936
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69



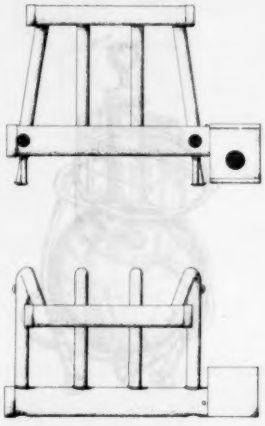
248,562
FISHING LURE
Cecil Lewis, P.O. Box 219, Smilax, Ky. 41764
Filed Aug. 1, 1975, Ser. No. 595,364
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

248,563
COMBINED GUN HOLSTER AND CARTRIDGE LOOPS
Roy L. Baker, Rte. #1, Box 245, Magnolia, Ark. 71753
Filed Sep. 15, 1976, Ser. No. 723,564
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



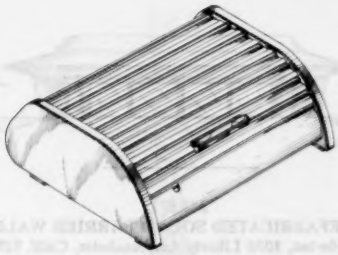
248,564
SPOUT
Donald W. Doman, Janesville, Wis., assignor to Kohler Co.
Filed Mar. 21, 1977, Ser. No. 779,926
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

248,565
COMBINED HEAT EXCHANGER AND FIREPLACE GRATE OR THE LIKE
Covington B. Watson, 538 Wayne Dr., Wilmington, N.C. 24801
Filed Mar. 4, 1977, Ser. No. 774,413
Term of patent 14 years
Int. Cl. D23—*03;* D7—*08*
U.S. Cl. D23—94



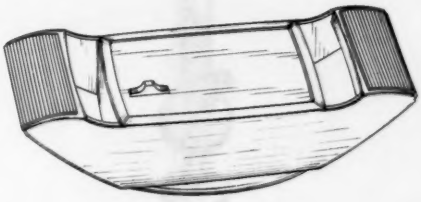
248,566
TELEPHONE ELECTROCARDIOGRAM TRANSMITTING EQUIPMENT CASE
Ronald R. Gorke, Maplewood, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Jul. 25, 1977, Ser. No. 818,641
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

248,567
STERILIZER CABINET
James R. Ward, 1520 S. Oates St., Dothan, Ala. 36301
Filed Jul. 6, 1976, Ser. No. 703,069
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9

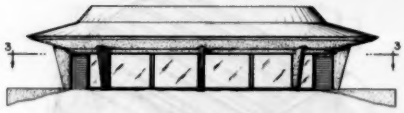


248,568
ANIMAL INTRADERMAL NOZZLE FOR JET INJECTION DEVICE
Aaron Ismach, 200 Upper College Ter., Frederick, Md. 21701
Filed Dec. 13, 1976, Ser. No. 750,138
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—25

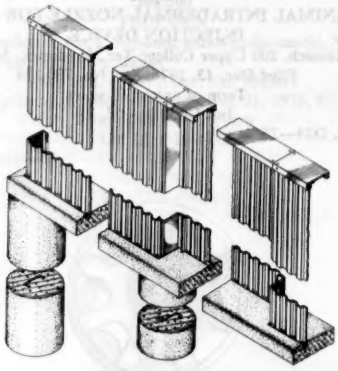
248,569
MASSAGER
Alfred W. Madl, 615 W. Fairfield Ct., Glendale, Wis. 53209, assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 12, 1976, Ser. No. 704,422
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



248,570
CAR WASH BUILDING
Judson L. Smith, and Bernard Stuart Siefer, both of Tempe, Ariz., assignors to Judson L. Smith
Filed Jun. 1, 1976, Ser. No. 691,525
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—31

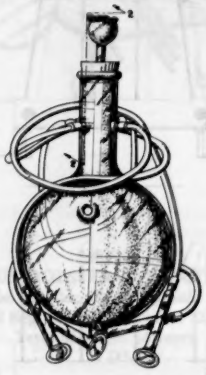


248,571
PREFABRICATED SOUND BARRIER WALL
Lewis R. Herbst, 1036 Liberty La., Anaheim, Calif. 92805
Filed Feb. 19, 1976, Ser. No. 659,296
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—38



248,572
SMOKING DEVICE
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,700
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

248,573
SMOKING DEVICE
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,813
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03



248,574
BOWL FOR A SMOKING DEVICE
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910
Filed Jan. 16, 1976, Ser. No. 649,721
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—05

248,575
HAIR DRYER

Wilhelmus Gerardus Elisabeth Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, Briarcliff Manor, N.Y.

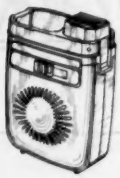
Filed Apr. 26, 1976, Ser. No. 680,455

Claims priority, application Netherlands, Nov. 14, 1975, 7550673

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—12



248,576
HAIR DRYER CASING

Wilhelmus Gerardus Elisabeth Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

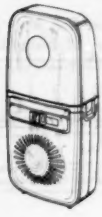
Filed Apr. 26, 1976, Ser. No. 680,456

Claims priority, application Netherlands, Nov. 14, 1975, 7550673

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—12



248,577
RAZOR HANDLE

David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 3, 1976, Ser. No. 720,335

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—48

248,578
RAZOR HANDLE

David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

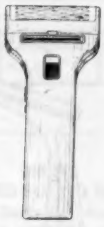
Filed Sep. 3, 1976, Ser. No. 720,336

Term of patent 14 years

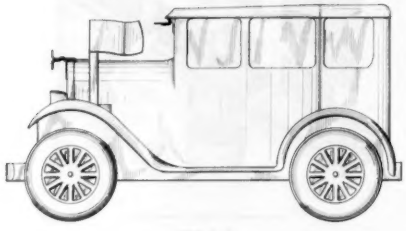
Int. Cl. D28—*03*

U.S. Cl. D28—48

248,579
ELECTRIC SHAVER
Akio Gotoh; Takeshi Takagi; Kuniharu Ichikawa, and Shinji Yamamoto, all of Oaza-Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan
Filed Dec. 28, 1976, Ser. No. 755,096
Claims priority, application Japan, Jun. 28, 1976, 51/24903
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



248,580
MAILBOX
Jabe Roy Luttrell, Webster La., Rocky Hill, Conn. 06067, and Edward Vincent Rhine, R.D. 1 Aumick Rd., Wallkill, N.Y. 12589
Filed Jan. 28, 1976, Ser. No. 653,276
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24

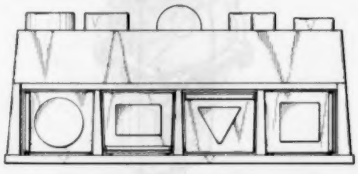


248,581
TOY ANIMAL FIGURE
Ronald Powell, Marlston Heyes Farm, Wrexham Road, Chester, CH4 9DE, Cheshire, England
Filed Aug. 10, 1976, Ser. No. 713,316
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

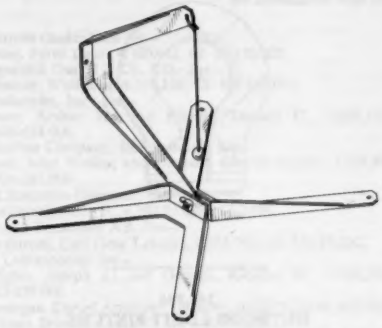
248,582
TOY FIGURE
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Aug. 2, 1976, Ser. No. 710,852
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

248,583
ICE-SKATE
Peter F. Zuuring, 100B des Prairies Boulevard - Apt. 501, Laval des Rapides, Quebec, Canada
Filed Jan. 4, 1977, Ser. No. 757,311
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 B

248,584
EDUCATIONAL BLOCK TOY
Paul D. Snyder, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 28, 1975, Ser. No. 635,588
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



248,585
PENDULUM GAME DEVICE
Launa J. Lincoln, 3 Green Acres Rd., St. Louis, Mo. 63137
Filed Sep. 29, 1976, Ser. No. 727,974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P

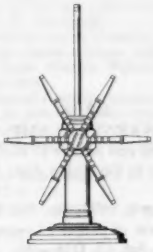


248,586
TOY MUSIC BOX
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co. Ltd., Tokyo, Japan
Filed Dec. 9, 1976, Ser. No. 748,852
Claims priority, application Japan, Jul. 29, 1976, 51/29703
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

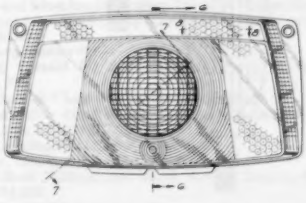
248,587
WATER SKI ROPE HANDLE
James T. Rumbaugh, 5660 Center Lake Dr., Spirit Lake, Iowa 51360
Filed Oct. 18, 1976, Ser. No. 733,427
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—41

248,588
APPLIQUE OR THE LIKE
Archer Allen Montague, Jr., 115 N. King Charles Rd., Raleigh, N.C. 27591
Filed Oct. 29, 1976, Ser. No. 736,697
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D33—9 C

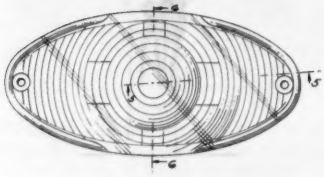
248,589
LAMP BASE
Clarence Williams, 2660 Dwight Rd., Memphis, Tenn. 38114
Filed Mar. 18, 1977, Ser. No. 779,132
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



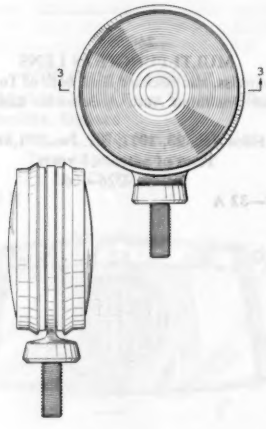
248,590
MULTI-FUNCTION LENS
Arthur A. Bleiweiss, and Richard Ball, both of Toronto, Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada
Filed Feb. 23, 1977, Ser. No. 771,540
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



248,591
COMBINED STOP AND TAIL LAMP LENS
Karel Urbaněk, Weston, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada
Filed Sep. 29, 1976, Ser. No. 727,976
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A

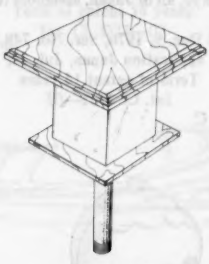


248,592
WARNING LAMP
Karel Urbaněk, Weston, and Arthur F. Bleiweiss, Toronto, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada
Filed May 4, 1977, Ser. No. 793,898
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



248,593
FLUORESCENT LIGHT BULB
Joseph Oster, Allentown, Pa., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Jun. 1, 1976, Ser. No. 691,946
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—33

248,594
OUTDOOR LIGHT FIXTURE
Paul W. Tirsbier, 1734 S. Martine Ave., Scotch Plains, N.J. 07076
Filed Aug. 1, 1977, Ser. No. 821,287
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—35



248,595
PORTABLE CALCULATING MACHINE
Myron Beitler, West Orange, and Stuart D. Leer, Chatham, both of N.J., assignors to Litton Business Systems, Inc.
Filed Mar. 21, 1977, Ser. No. 779,728
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

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TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Metso, Pertti Lauri, 4,100,662, Cl. 29-110.000.

A. Ehrenreich GmbH & Co. KG.: *See*—
Scheerer, Wolfgang, 4,101,228, Cl. 403-137.000.

A. F. Industries, Inc.: *See*—
Fieser, Arthur H.; and Finney, Donald C., 4,101,328, Cl. 428-624.000.

A. H. Robins Company, Incorporated: *See*—
Ward, John Wesley; and Leonard, Charles Arthur, 4,101,662, Cl. 424-267.000.

A. W. Chesterton Company: *See*—
Kozlowski, Peter F., 4,100,835, Cl. 87-1.000.

AB Record Taxameter AB: *See*—
Borgstrom, Carl Gote Lennart, 4,101,762, Cl. 235-95.00C.

Abbott Laboratories: *See*—
Difiglio, Joseph J.; and George, Richard W., 4,101,284, Cl. 23-259.000.
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,101,677, Cl. 424-330.000.

Abe, Koichiro: *See*—
Inoue, Makoto; Ikeda, Toshiki; and Abe, Koichiro, 4,101,944, Cl. 360-85.000.

Abe, Naohiro: *See*—
Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.

Abe, Seikou: *See*—
Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.

Abe, Yasuaki: *See*—
Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.

Aboyne Pty. Limited: *See*—
Pappas, Dennis Gerasimos, 4,101,872, Cl. 340-539.000.

Abramoska, Alfred A., Jr., to Arthur Products Co. Liquid filling tube with protective tip. 4,100,948, Cl. 141-392.000.

Abromavage, John C.: *See*—
Sage, Howard M.; and Abromavage, John C., 4,101,061, Cl. 224-42.10F.

ABU Aktiebolag: *See*—
Harre, Kurt Johan Stausgaard; and Thufvesson, Kenth Anker, 4,101,087, Cl. 242-84.20A.

ACF Industries, Incorporated: *See*—
Fischer, Robert L., 4,101,754, Cl. 219-121.00P.
Kull, George A., 4,101,175, Cl. 302-53.000.

Acme-Cleveland Corporation: *See*—
Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., 4,100,961, Cl. 164-180.000.

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Kapplinger, Lawrence E., 4,100,885, Cl. 119-73.000.

AEG-Elotherm, G.m.b.H.: *See*—
Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.

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Adam, Arlette, nee Chosson; LeFrancier, Pierre; and Lederer, Edgar, 4,101,649, Cl. 424-12.000.
Bertucci, Albert Flamidien, 4,101,299, Cl. 55-222.000.
Bessaguet, Louis Pierre, 4,100,701, Cl. 51-157.000.

AGFA-Gevaert A.G.: *See*—
Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, 4,101,217, Cl. 355-38.000.
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Lafferty, Robert M.; and Heinzle, Elmar, 4,101,533, Cl. 528-491.000.

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Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, to Northrop Weaving Machinery Limited. Rapier looms. 4,100,941, Cl. 139-449.000.

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Marancik, William G., 4,101,731, Cl. 174-126.00S.

Airhart, Tom P., to Atlantic Richfield Company. Fast cycle seismic gas exploder and method. 4,100,991, Cl. 181-117.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Tamura, Tooru, 4,100,894, Cl. 123-117.00A.

Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, to Hitachi, Ltd. Chemically digestive agents. 4,101,440, Cl. 252-186.000.

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Johansson, Erik Karl Gustav, 4,100,644, Cl. 15-397.000.
Leinfelt, Karl Eric, 4,100,878, Cl. 116-114.0AD.

Akzona Incorporated: *See*—
Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., 4,100,796, Cl. 73-160.000.
Panneman, Harm Jan, 4,101,675, Cl. 424-326.000.

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Wornall, William D.; and Valk, Nick, 4,100,651, Cl. 19-145.500.

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Henderson, Henning M., 4,101,869, Cl. 340-52.00R.

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Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,101,579, Cl. 260-559.00R.

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Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, 4,101,093, Cl. 242-107.40A.
Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,101,436, Cl. 252-67.000.

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Alsten Company, The: *See*—
Schuander, Eric, 4,101,023, Cl. 206-45.190.

Altec Industries, Inc.: *See*—
Freudenthal, Frank D., 4,100,973, Cl. 173-44.000.

Aluminium Pechiney: *See*—
Mercier, Henri; Magrone, Robert; and Deabriges, Jean, 4,101,629, Cl. 423-121.000.

Aluminum Company of America: *See*—
Feichter, Lowell H.; and Anderson, Albert R., 4,101,343, Cl. 136-230.000.
Hargis, Robert L., 4,101,393, Cl. 204-67.000.
Lamberti, Thomas G.; and Rowe, Harry B., 4,101,632, Cl. 423-210.000.
Urbanic, John M.; and Major, Burney A., 4,101,751, Cl. 219-74.000.

Amark Industries, Inc.: *See*—
Williams, David E., 4,101,611, Cl. 261-142.000.

Amberg, Stephen W., to Owens-Illinois, Inc. Web handling apparatus for producing shrunken pilfer-proof neck labels for containers. 4,100,841, Cl. 93-1.00G.

Ambrosini, Ronald Frank; Anderson, Richard Alan; Fornoff, Louis Leonard; and Manchanda, Krishan Dayal, to Union Carbide Corporation. Selective adsorption of mercury from gas streams. 4,101,631, Cl. 423-210.000.

Amerace Corporation: *See*—
Morgan, Donald F.; and Wolosky, Irwin S., 4,101,463, Cl. 260-2.300.

American Color & Chemical Corporation: *See*—
Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., 4,101,544, Cl. 260-207.100.

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Boldizar, Leslie, 4,101,520, Cl. 528-248.000.
Lutz, Albert William; and Diehl, Robert Eugene, 4,101,582, Cl. 260-574.000.

American Hoechst Corporation: *See*—
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,101,663, Cl. 424-267.000.

McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,101,559, Cl. 260-347.300.
American Optical Corporation: *See*—
Krohn, David A.; and Deeg, Emil W., 4,101,302, Cl. 65-30.00R.
American Safety Equipment Corporation: *See*—
Sieber, William J., 4,101,143, Cl. 280-42.000.
American Technical Industries, Inc.: *See*—
Dieffenbach, Percy; and Zon, Louis, 4,101,697, Cl. 428-9.000.
Ameron, Inc.: *See*—
Wells, Frank M.; and Black, Gordon J., 4,101,622, Cl. 264-251.000.
Ammann, Steve, to Quantor Corporation. Film processing apparatus. 4,101,919, Cl. 354-319.000.
Ammons, Vernon G., to PPG Industries, Inc. Hard, optically clear polyurethane articles. 4,101,529, Cl. 528-67.000.
AMP Incorporated: *See*—
Carter, Clyde Thomas, 4,101,095, Cl. 242-115.000.
Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, 4,101,189, Cl. 339-99.00R.
Anderson, Albert R.: *See*—
Feichter, Lowell H.; and Anderson, Albert R., 4,101,343, Cl. 136-230.000.
Anderson, Benjamin Ernest; and McIntyre, Louise Creegan. Device to locate commonly misplaced objects. 4,101,873, Cl. 340-539.000.
Anderson, Richard Alan: *See*—
Ambrosini, Ronald Frank; Anderson, Richard Alan; Fornoff, Louis Leonard; and Manchanda, Krishan Dayal, 4,101,631, Cl. 423-210.000.
Anderson, Robert J., to Beckman Instruments, Inc. Method and apparatus for signalling the introduction of chemical reaction components into a chemical analyzing system. 4,101,276, Cl. 23-230.00B.
Anderson, Robert M.; and Hanson, James M., to General Electric Company. Multiple flashlamp array. 4,101,953, Cl. 362-11.000.
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Anderson, William B.; and Yulga, Julius J., to Rexnord Inc. Roller assembly. 4,101,180, Cl. 308-20.000.
Ando, Hiromi, to Tokico Ltd. Vacuum augmentation device. 4,100,839, Cl. 91-369.00B.
Ando, Hiromi: *See*—
Tateoka, Kiyoshi; Ando, Hiromi; and Azuma, Tomizo, 4,100,838, Cl. 91-1.000.
Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Work-post console for semi automatic machines. 4,101,084, Cl. 242-7.110.
Andrejewski, Werner: *See*—
Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, 4,101,496, Cl. 260-31.20R.
Andrevski, Zygmunt Marian, to RCA Corporation. Flat display device with beam guide. 4,101,802, Cl. 313-422.000.
Andrews, Christopher Michael, to Ciba-Geigy Corporation. New compositions for curing epoxide resins. 4,101,459, Cl. 260-18.0EP.
Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., to General Electric Company. Semiconductor body heater. 4,101,759, Cl. 219-343.000.
Anthony, Timothy M. Jump rope. 4,101,123, Cl. 272-75.000.
Antos, George J., to UOP Inc. Catalytic reforming of a naphtha fraction. 4,101,418, Cl. 208-139.000.
Antoszewski, Alex Joseph, to Leigh Products, Inc. Folding wall bracket. 4,101,107, Cl. 248-218.400.
Aoki, Hirokazu: *See*—
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
Aoki, Katashi, to Nissei Plastics Industrial Co., Ltd. Injection blow molding method for hollow article having openings at both ends. 4,101,618, Cl. 264-97.000.
Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.). Pickup tone arm. 4,101,133, Cl. 274-23.00R.
Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, to Fuji Photo Film Co., Ltd. Process for producing ferromagnetic metal powder. 4,101,311, Cl. 75-0.500.
Aoyama, Eiji, to Nihon Beru-Haueru Kabushiki Kaisha. Automatic recording level control circuit with manual sensitivity compensating circuit. 4,101,843, Cl. 330-280.000.
Arai, Hiroshi: *See*—
Mori, Mamoru; and Arai, Hiroshi, 4,101,170, Cl. 297-389.000.
Arai, Takao: *See*—
Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,101,841, Cl. 330-254.000.
Araki, Nobuyuki: *See*—
Nakayama, Shozo; Kurahashi, Masayuki; and Araki, Nobuyuki, 4,101,250, Cl. 417-269.000.
Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Catalytic reaction apparatus. 4,101,290, Cl. 23-288.00R.
Archer, Dorothy J.: *See*—
Mineck, Fred, 4,100,898, Cl. 123-119.00B.
Arff, Heino: *See*—
Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, 4,101,093, Cl. 242-107.40A.
Schmelow, Harald Martin; Weman, Per Olof; and Arff, Heino, 4,101,092, Cl. 242-107.40B.
Argus Chemical Corporation: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,101,508, Cl. 260-45.80N.
Arlt, Dieter: *See*—
Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, 4,101,569, Cl. 260-463.000.
Uhrhan, Paul; Lantzsch, Reinhard; Oertel, Harald; Roos, Ernst; and Arlt, Dieter, 4,101,506, Cl. 260-45.80N.
Armstrong, Ernest DeLoy. Fireplace heating system. 4,100,913, Cl. 126-121.000.
Armstrong, Lee R.: *See*—
Goetsch, Henry E.; Cook, James A.; and Armstrong, Lee R., 4,100,793, Cl. 73-118.000.
Arno, David Michael, to Johns-Manville Corporation. Radially expansible collet for a tubular sleeve. 4,101,085, Cl. 242-18.00G.
Artbauer, Jan, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Gas insulated high voltage cable. 4,101,728, Cl. 174-29.000.
Arthur D. Little, Inc.: *See*—
Clancy, John J.; and Wells, Robert C., 4,100,853, Cl. 101-401.100.
Arthur Products Co.: *See*—
Abramoska, Alfred A., Jr., 4,100,948, Cl. 141-392.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,101,324, Cl. 96-36.300.
Asano, Atsushi: *See*—
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
Asano, Chihiro: *See*—
Takagi, Katsuyuki; and Asano, Chihiro, 4,101,862, Cl. 338-23.000.
Asano, Masaharu, to Nissan Motor Company, Limited. Closed-loop mixture control for an internal combustion engine of a roadway vehicle with means for compensating for fuel deficiency during vehicle start-up periods. 4,100,892, Cl. 123-32.0EE.
Askins, Barbara S., to United States of America, National Aeronautics and Space Administration. Method of obtaining intensified image from developed photographic films and plates. 4,101,780, Cl. 250-475.000.
Aslam, Muhammed Javed. Device for the collection and processing of stool specimens. 4,101,279, Cl. 23-259.000.
Asplund, Herbert Frederick: *See*—
Hess, John R.; and Asplund, Herbert Frederick, 4,101,245, Cl. 416-190.000.
Atkins, Carl E.; and McGuirk, Francis A., Jr., to Wagner Electric Corporation. Dual channel wide-band frequency modulated keyable control circuit and keying circuit therefor. 4,101,791, Cl. 307-308.000.
Atkinson, Cyril Millward: *See*—
Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, 4,100,941, Cl. 139-449.000.
Atlantic Richfield Company: *See*—
Airhart, Tom P., 4,100,991, Cl. 181-117.000.
Burger, Edward D., 4,101,035, Cl. 209-114.000.
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.
Atlas Foundry & Mfg. Co.: *See*—
Griffiths, Bernard L., 4,101,726, Cl. 13-29.000.
Au-Tom-A-Ton Research Company: *See*—
Vail, Ande R., 4,101,787, Cl. 307-81.000.
Audi Nsu Auto Union Aktiengesellschaft: *See*—
Kromer, Gunter, 4,100,911, Cl. 123-205.000.
Augostini, Peter P.: *See*—
Kent, Jerry B.; and Augostini, Peter P., 4,101,494, Cl. 260-29.60B.
Aultz, Daniel Eugene: *See*—
McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,101,559, Cl. 260-347.300.
Ausnit, Steven. Method of and means for making variable width zipper profile film. 4,101,355, Cl. 156-66.000.
Austin, Eric Paul, to Simon-Hartley Limited. Electrolytic flotation apparatus. 4,101,409, Cl. 204-277.000.
Auto Research Corporation: *See*—
Smith, Carl H., 4,101,001, Cl. 184-6.400.
Autosonics, Inc.: *See*—
Rand, Burton, 4,101,340, Cl. 134-11.000.
Autovox S.p.A.: *See*—
Cicatelli, Rodolfo, 4,101,949, Cl. 360-137.000.
Avery International Corp.: *See*—
Dunning, Richard E.; and Rampelberg, Victor H., 4,101,698, Cl. 428-31.000.
Avtex Fibers Inc.: *See*—
Knopka, Williamm N., 4,101,528, Cl. 260-45.75R.
Azuma, Ichiro: *See*—
Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.
Azuma, Tomizo: *See*—
Tateoka, Kiyoshi; Ando, Hiromi; and Azuma, Tomizo, 4,100,838, Cl. 91-1.000.
B. F. Goodrich Company, The: *See*—
Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, 4,100,955, Cl. 152-362.0CS.
Rowe, Eugene Hugh, 4,101,604, Cl. 260-862.000.
Tucker, Harold A., 4,101,491, Cl. 260-29.60T.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.
Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, to USM Corporation. Automatic work guidance mechanism. 4,100,864, Cl. 112-121.110.

Bachmann, Gerhard: *See*—
Reinecke, Harry; and Bachmann, Gerhard, 4,100,868, Cl. 112-277.000.

Bacskai, Robert, to Chevron Research Company. Pyrrolidone polymerization catalyst system. 4,101,447, Cl. 252-431.00C.

Bacskai, Robert, to Chevron Research Company. Anionic copolymerization of 2-pyrrolidone with caprolactam or piperidone. 4,101,531, Cl. 528-315.000.

Badger Meter, Inc.: *See*—
Bradham, Allen C., III; and Seruga, Edward A., 4,100,799, Cl. 73-197.000.
Pelt, Thomas E., 4,100,800, Cl. 73-197.000.

Baird-Kerr, Richard G.: *See*—
Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.

Baizer, Manuel M.: *See*—
Hallcher, Richard C.; and Baizer, Manuel M., 4,101,392, Cl. 204-59.00R.

Baker, Lamar T., to Xerox Corporation. MOS buffer circuit. 4,101,788, Cl. 307-205.000.

Baker, Max Norris; and Martin, Julian Richard, to R. J. Reynolds Tobacco Co. Method for applying transfers. 4,101,362, Cl. 156-235.000.

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Balchunas, Charles A., to General Electric Company. Appliance strain relief. 4,101,729, Cl. 174-65.00R.

Balda-Werke: *See*—
Lange, Karl Heinz, 4,101,915, Cl. 354-144.000.

Balkwill, John Treagus, to International Telephone and Telegraph Corporation. Perforate glass structures and method of making the same. 4,101,303, Cl. 65-31.000.

Ballou, E. Vernon: *See*—
United States of America, National Aeronautics and Space Administration; Ballou, E. Vernon; Wood, Peter C.; Wydeven, Theordore J., Jr.; and Spitze, LeRoy A., 4,101,644, Cl. 423-581.000.

Baltek Corporation: *See*—
Roberts, Wm. Mel; and Kohn, Jean, 4,101,045, Cl. 220-404.000.

Balzers Patent-und Beteiligungs-Aktiengesellschaft: *See*—
Daxinger, Helmut, 4,101,200, Cl. 350-166.000.

Banigan, Thomas F.: *See*—
Morrisroe, John J.; and Banigan, Thomas F., 4,101,589, Cl. 260-615.00B.

Bank, Nathan: *See*—
Allesch, Ernst; and Bank, Nathan, 4,101,037, Cl. 211-167.000.

Banks, Arthur James: *See*—
Dischert, Robert Adams; Banks, Arthur James; and Hopkins, Robert Sherman, Jr., 4,101,926, Cl. 358-17.000.

Barbot, Jean Luc Y.; and Remon-Beauvais, Philippe M., to Etat Francais. Pneumatic cell for gas confinement in surface effect vehicle. 4,100,989, Cl. 180-127.000.

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Barch, Herbert W.; and Bohy, August G., to PPG Industries, Inc. Method for producing slubby yarn. 4,100,726, Cl. 57-157.00F.

Barie, Walter P., Jr.; and Eurich, James T., to Gulf Research & Development Company. Clear and colorless epoxide dianhydride cured resins. 4,101,516, Cl. 528-112.000.

Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, to Societe Nationale Industrielle Aerospatiale. Solar generator. 4,101,101, Cl. 244-173.000.

Barker, Robert I.; and King, David P., to Monsanto Company. Optical method and apparatus for determining stress relaxation. 4,101,612, Cl. 264-22.000.

Barkey, Kenneth T., to Eastman Kodak Company. Process for making stabilized polyesters used in radiation-sensitive compositions for lithographic plates having improved wear life including hindered phenols and phosphoric acid esters. 4,101,326, Cl. 96-67.000.

Barnby, Donald W. Competitive game apparatus. 4,101,131, Cl. 273-239.000.

Barnes, Casper W., Jr., to Dresser Industries, Inc. Fluid flow regulation. 4,100,927, Cl. 137-9.000.

Barp, Bruno; and Holik, Herbert, to Escher Wyss GmbH. Drying cylinder for a paper making machine. 4,100,683, Cl. 34-124.000.

Barr, Derek Julian, to Barr & Murphy Limited. Drying apparatus and method. 4,101,264, Cl. 432-14.000.

Barr & Murphy Limited: *See*—
Barr, Derek Julian, 4,101,264, Cl. 432-14.000.

Barrable, Victor Ernest, to Cape Boards & Panels Ltd. Building board. 4,101,335, Cl. 106-99.000.

Barrett, Warren E. Telephone book holder. 4,101,184, Cl. 312-233.000.

Barron, Alvie, to Royal Tool Company, Inc. Drilling stabilizer including mechanical interlock device. 4,101,179, Cl. 308-4.00A.

Barroso, Angel Lorenzo. Clamping machine. 4,100,716, Cl. 53-138.00A.

Barsellotti, John Anthony, to International Standard Electric Corporation. Line circuit for key telephone systems. 4,101,740, Cl. 179-99.000.

Bart, Hans U., to Teledyne Industries, Inc. Piezoelectric fuel injector valve. 4,101,076, Cl. 239-584.000.

Bart, Philip D., to PBI, Inc. Apparatus for aerating a liquid. 4,101,607, Cl. 261-36.00R.

Bartoletto, Avellino J. Chain shackle. 4,100,729, Cl. 59-86.000.

Bartolini, Robert Alfred: *See*—
Bell, Alan Edward, Bartolini, Robert Alfred; and Bloom, Allen, 4,101,907, Cl. 346-135.000.

BASF Aktiengesellschaft: *See*—
Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, 4,100,659, Cl. 28-255.000.
Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,101,571, Cl. 260-543.00R.
Kohl, Lambert; Schneider, Richard; and Uhl, Karl, 4,101,027, Cl. 206-309.000.
Nienburg, Hans Juergen; and Kummer, Rudolf, 4,101,588, Cl. 260-615.00A.

Bass, Sidney; and Rich, Hubert Allen, to Mattel, Inc. Sewing machine. 4,100,867, Cl. 112-270.000.

Batova, Kemal: *See*—
Denkinger, Marian C.; and Batova, Kemal, 4,101,106, Cl. 248-188.900.

Battelle Development Corporation: *See*—
Selders, Matthias Peter, 4,101,341, Cl. 136-89.0TF.

Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., to John Thomas Batts, Inc. Tally. 4,101,059, Cl. 223-85.000.

Batts, Robert Lee, to Johns-Manville Corporation. Method of coating strand material. 4,101,695, Cl. 427-434.00D.

Baude, Frederic John; and Cupery, Willis Eli, to Du Pont de Nemours, E. I., and Company. Stabilized formulations of 2-alkoxyimino-N-carbamoyl-2-cyanoacetamides. 4,101,669, Cl. 424-286.000.

Bauer Kaba AG Sicherheits-Schliessyteme: *See*—
Gretler, Heinrich, 4,100,778, Cl. 70-406.000.

Bauer, Manfred: *See*—
Dietrich, Walter; and Bauer, Manfred, 4,100,843, Cl. 93-53.00M.

Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, to BASF Aktiengesellschaft. Process for texturizing filaments. 4,100,659, Cl. 28-255.000.

Bauerle, Gerhard; and Hubner, Oswald, to Bunker Ramo Corporation. Electrical connector with releasable contact members. 4,101,192, Cl. 339-217.00S.

Baum, Walter: *See*—
Dennstadt, Heinz; and Baum, Walter, 4,100,772, Cl. 69-47.000.

Baxter Travenol Laboratories, Inc.: *See*—
Miller, Joe A., 4,100,953, Cl. 150-0.500.

Bayer Aktiengesellschaft: *See*—
Bock, Manfred; Pedain, Josef; and Braden, Rudolf, 4,101,578, Cl. 260-563.00R.
Bockelman, Wolfgang; and Niederprum, Hans, 4,101,271, Cl. 8-94.260.
Burkhardt, Tilo; and Schonfelder, Manfred, 4,101,530, Cl. 528-45.000.
Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, 4,101,575, Cl. 260-553.00E.
Groll, Manfred; and Bien, Hans-Samuel, deceased, 4,101,551, Cl. 260-283.0SA.
Herzig, Joachim, 4,101,499, Cl. 260-37.0SB.
Kramer, Erich, 4,101,542, Cl. 260-158.000.
Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, 4,101,569, Cl. 260-463.000.
Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, 4,100,660, Cl. 28-271.000.
Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, 4,101,468, Cl. 521-115.000.
Reitz, Gunther; and Boehmke, Gunther, 4,101,489, Cl. 260-29.300.
Uhrhan, Paul; Lantzsch, Reinhard; Oertel, Harald; Roos, Ernst; and Arlt, Dieter, 4,101,506, Cl. 260-45.80N.

BBC Brown Boveri & Company Limited: *See*—
Bomford, Michael J.; and Gessinger, Gernot, 4,101,712, Cl. 428-547.000.
Gyarmathy, Georg; and Pfenninger, Hans, 4,100,745, Cl. 60-652.000.

Bean, Charles P.; and Uzgiris, Egidijus E., to General Electric Company. Laser Doppler spectroscopy with smoothened spectra line shapes. 4,101,220, Cl. 356-105.000.

Bear Brand Hosiery Co.: *See*—
Davis, Farris L., 4,100,624, Cl. 2-409.000.

Beckett, Allan: *See*—
Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, 4,100,941, Cl. 139-449.000.

Beckman Instruments, Inc.: *See*—
Anderson, Robert J., 4,101,276, Cl. 23-230.00B.
Reeves, George I.; and Keegan, Jack J., 4,101,859, Cl. 336-90.000.
Way, Allan S., 4,101,219, Cl. 356-89.000.

Becton, Dickinson and Company: *See*—
Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, 4,101,041, Cl. 215-6.000.

Beecham Group Limited: *See*—
Clark, Judith Ann, 4,101,676, Cl. 424-330.000.

Belfiore, Erasmo: *See*—
Wilkinson, Brendan Michael; and Belfiore, Erasmo, 4,100,982, Cl. 175-206.000.

Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, to RCA Corporation. Overcoat structure for optical video disc. 4,101,907, Cl. 346-135.000.

Bell-Fruit Manufacturing Company Limited: *See*—
Cox, Calvin Howard, 4,101,129, Cl. 273-143.00R.

Bell & Howell Company: *See*—
Flint, John R.; and Rabindran, K. George, 4,101,763, Cl. 250-214.00R.
Flint, John R., 4,101,808, Cl. 315-151.000.
Kim, Raymond W. H.; Lodge, Edward H.; and Lueders, Arthur L., 4,101,097, Cl. 242-205.000.

Bell Telephone Laboratories, Incorporated: *See*—
Albanese, Andres, 4,101,847, Cl. 331-94.50S.
Silfvast, William Thomas, 4,101,396, Cl. 204-157.10R.

Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, to Telecommunications Radioelectriques et Telephoniques T.R.T. Arrangement for processing auxiliary signals in a frequency multiplex transmission system. 4,101,738, Cl. 179-15.0FD.

Bellaplast GmbH: *See*—
Geppert, Barbara; and Huth, Kurt, 4,101,047, Cl. 220-258.000.

Belleau, Bernard R.: *See*—
Kavadias, Gerry; and Belleau, Bernard R., 4,101,556, Cl. 260-307.00C.

Belov, Gennady Petrovich: *See*—
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

Bendix Corporation, The: *See*—
Burnett, Richard T., 4,101,010, Cl. 188-79.50P.
Burnett, Richard T., 4,101,011, Cl. 188-79.5GT.
Kiwior, Alexander Michael, 4,101,074, Cl. 239-585.000.
Myers, William Perry; and Torzala, Terence August, 4,101,298, Cl. 55-163.000.
Sima, Gordon R., Jr.; and Taylor, John L., Jr., 4,100,810, Cl. 73-647.000.

Benjamin, Gary L., to Kuss Corporation. Water mattress construction. 4,100,634, Cl. 5-365.000.

Benton, Lawrence M., Jr. Visual display with magnetic overlay. 4,101,884, Cl. 340-366.00B.

Berchtold, Jean, to Spin Physics. Process for preparing hot-pressed sintered alloys. 4,101,348, Cl. 148-105.000.

Berger, Stuart. Holder device for paper articles and writing instruments. 4,100,684, Cl. 35-62.000.

Berges, David A., to Smithkline Corporation. 7βAcylamino-3-(alkanesulfonamidoalkyl substituted tetrazolylthiomethyl) cephalosporins, antibacterial compositions containing them and methods of treating bacterial infections with them. 4,101,656, Cl. 424-246.000.

Bergman, Thomas W. Separator for separating higher density metal values from earthen material. 4,101,419, Cl. 209-13.000.

Berniolles, Jean-Marie; and Jogand, Patrick, to Commissariat a l'Energie Atomique. Fast neutron reactor. 4,101,377, Cl. 176-40.000.

Bers, Abraham: *See*—
Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., 4,101,965, Cl. 364-821.000.

Berthet, Aristide: *See*—
Vayssiere, Pierre; and Berthet, Aristide, 4,101,313, Cl. 75-60.000.

Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A.; and Electricite de France, Service National. Rotating machine using a cooling fluid supplied by a rotating seal. 4,101,793, Cl. 310-52.000.

Bertin & Cie: *See*—
Facon, Pierre Jean Alphonse, 4,100,747, Cl. 61-5.000.

Bertling, Gerhard: *See*—
Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, 4,100,897, Cl. 123-119.0EC.

Bertucci, Albert Flamidien, to Agence Nationale de Valorisation de la Recherche (ANVAR). Apparatus for discharging smokes, fumes and greases from kitchens. 4,101,299, Cl. 55-222.000.

Bessaguet, Louis Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Ultrasonic machining. 4,100,701, Cl. 51-157.000.

Betts, William L., to United States of America, Army. Digital filter for pulse code modulation signals. 4,101,964, Cl. 364-724.000.

Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, to Hoechst Aktiengesellschaft. Process for the level dyeing of synthetic fiber materials. 4,101,274, Cl. 8-173.000.

Beyer, Horst; and Buran, Ulrich, to Goetzewerke Friedrich Goetze AG. Plasma deposition welding powder for producing wear resistant layers. 4,101,319, Cl. 75-252.000.

BFG Glassgroup: *See*—
Marchand, Jean, 4,101,304, Cl. 65-135.000.

Bhandari, Ashok Kumar; and Kalbag, Shrinath Sheshgiri, to Lever Brothers Company. Treatment of saponified synthetic fatty acids. 4,101,562, Cl. 260-419.000.

BHS-Bayerische Berg-,Hutten-und Salzerke Aktiengesellschaft: *See*—
Maier, Johann, 4,101,367, Cl. 156-471.000.

Bianchi, John E.; and Nichols, Richard D. E. Holster with improved belt loop lock. 4,101,060, Cl. 224-2.00B.

Bianchi, Raymond A.; and Campen, Harry E., to Caterpillar Tractor Co. Idler wear strip retainer for track-type vehicles. 4,101,177, Cl. 305-31.000.

Biehler, Jean-Marie J.; Lecolier, Serge L.; and Le Roy, Patrice M., to Societe Nationale des Poudres et Explosifs. Flame resistance of foams using diethyl hydroxymethylphosphonate esters. 4,101,472, Cl. 521-85.000.

Bien, Else, administrator: *See*—
Groll, Manfred; and Bien, Hans-Samuel, deceased, 4,101,551, Cl. 260-283.0SA.

Bien, Hans-Samuel, deceased: *See*—
Groll, Manfred; and Bien, Hans-Samuel, deceased, 4,101,551, Cl. 260-283.0SA.

Bierman, Laurence William; and Long, Gary Lynn, to J. R. Simplot Company. Direct granulation process for triple superphosphate. 4,101,637, Cl. 423-309.000.

Biethan, Uwe: *See*—
Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, 4,101,496, Cl. 260-31.20R.

Bijker, Anno: *See*—
Pons, Dick A.; and Bijker, Anno, 4,101,490, Cl. 260-29.6MP.

Bingham, John A. C.; and Maxwell, Ronald K., to Vadic Corporation, The. Duplex data transmission modem utilizing an injected tone for shifting power within the transmit spectrum. 4,101,833, Cl. 325-30.000.

Bingo, Kazuyoshi; and Kawai, Katsuo, to Japan Atomic Energy Research Institute. Method for direct measurement of beta-ray absorbed dose rate and an instrument therefor. 4,101,769, Cl. 250-361.00R.

Birke, August H., to Shell Oil Company. Lubricant compositions. 4,101,429, Cl. 252-32.70E.

Biro, Katalin: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.

Bishop, Arthur E. Method and apparatus for manufacturing valve components. 4,100,785, Cl. 72-189.000.

Bishop, Byron Norman. Block and brace assembly. 4,101,111, Cl. 249-205.000.

Bizen, Kunio: *See*—
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.

Black, Gordon J.: *See*—
Wells, Frank M.; and Black, Gordon J., 4,101,622, Cl. 264-251.000.

Blackburn, Keith: *See*—
Ross, Douglas; and Blackburn, Keith, 4,101,144, Cl. 280-423.00B.

Blackmer, David E.; and Jaeger, C. Rene, to DBX, Inc. Adaptive filter. 4,101,849, Cl. 333-14.000.

Blahak, Johannes: *See*—
Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, 4,101,569, Cl. 260-463.000.

Blain, Jean R.: *See*—
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.

Blanchard, James A. Fishing rod jigging apparatus. 4,100,695, Cl. 43-19.200.

Bloch, deceased; Rene: *See*—
Rubinstein, Menachem; Simon, Shulamit; and Bloch, deceased; Rene, 4,101,380, Cl. 195-63.000.

Blockley, Alec Gordon: *See*—
McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, 4,100,825, Cl. 82-3.000.

Bloom, Allen: *See*—
Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, 4,101,907, Cl. 346-135.000.

Blum, Emil. Musical chime device. 4,101,885, Cl. 340-384.00E.

Blumenthal, Robert N.; and Melville, Andreas T. Hot gas measuring device. 4,101,404, Cl. 204-195.00S.

Bobrov, Vladimir Timofeevich; Druzhaev, Jury Avraamovich; and Lebedeva, Nelli Alexandrovna. Method for excitation and reception of ultrasonic plate waves in workpieces and devices for realizing same. 4,100,809, Cl. 73-638.000.

Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich. Building roofing structure. 4,100,708, Cl. 52-222.000.

Bochkarev, Ellin Petrovich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Bock, Manfred; Pedain, Josef; and Braden, Rudolf, to Bayer Aktiengesellschaft. Cycloaliphatic triamines. 4,101,578, Cl. 260-563.00R.

Bockelman, Wolfgang; and Niederprum, Hans, to Bayer Aktiengesellschaft. Tanning skins using polycarboxylic acid partial esters. 4,101,271, Cl. 8-94.260.

Boehmke, Gunther: *See*—
Reitz, Gunther; and Boehmke, Gunther, 4,101,489, Cl. 260-29.300.

Boehringer Ingelheim GmbH: *See*—
Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.

Boehringer Mannheim GmbH: *See*—
Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.

Boeing Company, The: *See*—
Dehler, William H., 4,101,828, Cl. 324-65.00R.
Feleus, Christiaan C., 4,100,876, Cl. 114-274.000.
Scott, John H.; and Weist, Walter R., 4,100,877, Cl. 115-11.000.

Bohrdt, Joaquin: *See*—
Grieger, Gerhard; and Bohrdt, Joaquin, 4,101,746, Cl. 200-82.00B.

Bohy, August G.: *See*—
Barch, Herbert W.; and Bohy, August G., 4,100,723, Cl. 57-34.00B.
Barch, Herbert W.; and Bohy, August G., 4,100,726, Cl. 57-157.00F.

Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, to GB Fermentation Industries, Inc. Enzyme complex hydrolyzing bacterial mucus. 4,101,379, Cl. 195-62.000.

Boldizar, Leslie, to American Cyanamid Company. Methylated, methylolated melamine composition. 4,101,520, Cl. 528-248.000.

Bomford, Michael J.; and Gessinger, Gernot, to BBC Brown Boveri & Company Limited. Method of producing a material with locally different properties and applications of the method. 4,101,712, Cl. 428-547.000.

Bonati, Attilio, to Inverni Della Beffa S.p.A. Pharmaceutically active complexes and pharmaceutical compositions containing eascin and sterols. 4,101,652, Cl. 424-49.000.

Bondarev, Gennady Ivanovich: *See*—
Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, 4,101,243, Cl. 415-201.000.

Bongartz, Paul: *See*—
Haag, Franz; and Bongartz, Paul, 4,101,116, Cl. 366-142.000.

Bonk, Joseph P., to Colgate-Palmolive Company. Pre-moistened towelette dispenser. 4,101,026, Cl. 206-205.000.

Bonnerot, Georges: *See*—
Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, 4,101,738, Cl. 179-15.0FD.

Boop, Gene T. Technique for disarming and arming electrically fireable explosive well tool. 4,100,978, Cl. 175-4.550.

Bopp, Louis A.: *See*—
Schmidt, Gertraud A.; and Bopp, Louis A., 4,101,512, Cl. 260-45.95C.

Borchert, Robert Curtis, to Union Carbide Corporation. Enhanced heat transfer device manufacture. 4,101,691, Cl. 427-229.000.

Borg-Warner Corporation: *See*—
Albertson, Clarence Elmo, 4,100,756, Cl. 62-2.000.
Harnish, James Ranck, 4,100,935, Cl. 137-533.110.
Meixner, Edwin Joseph, 4,100,794, Cl. 73-136.00A.
Radke, Edmund John, 4,101,015, Cl. 192-106.200.
Woollard, Gary A., 4,100,818, Cl. 74-230.17E.

Borgert, Wilhelm: *See*—
Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, 4,100,650, Cl. 19-105.000.

Borgstrom, Carl Gote Lennart, to AB Record Taxameter AB. Recording distance measuring instrument at vehicle wheel hub. 4,101,762, Cl. 235-95.00C.

Borsi, Jozsef: *See*—
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.

Bos, Horst, to Gebr. Marklin & Cie. GmbH. Driving mirror assembly. 4,101,205, Cl. 350-289.000.

Bosch, Paul, to Robert Bosch GmbH. Radial piston machine. 4,100,840, Cl. 91-491.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Mayer, Rolf; and Speckhart, Max, 4,101,082, Cl. 241-282.100.

Bosso, Joseph F.; and Sturni, Lance C., to PPG Industries, Inc. Cationic electrodepositable compositions. 4,101,486, Cl. 260-29.2TN.

Botek Praezisions-Bohrtechnik Schur & Co., Firma: *See*—
Herrmann, Lothar; and Schur, Gotthold, 4,100,983, Cl. 175-383.000.

Bous, Karl. Apparatus for dyeing filamentary material. 4,100,724, Cl. 57-35.000.

Bousaid, Issam S., to Texaco Inc. Oil recovery process using an emulsion slug with tapered surfactant concentration. 4,100,966, Cl. 166-273.000.

Bouvier, Jean-Pierre: *See*—
Dandrel, Francois; and Bouvier, Jean-Pierre, 4,101,811, Cl. 315-200.00R.

Boyce, Jennings A.: *See*—
Stine, Clifford R.; and Boyce, Jennings A., 4,101,699, Cl. 428-36.000.

Bracey, Jep T., to Towler, Martin L.; and Langdon, Jack M., part interest to each. Oxygen impregnation method. 4,101,608, Cl. 261-36.00R.

Brackman, Donald A., to Hobart Corporation. Food processing apparatus. 4,101,977, Cl. 366-246.000.

Brackman, Donald A., to Hobart Corporation. Food processing apparatus. 4,101,978, Cl. 366-314.000.

Braden, Rudolf: *See*—
Bock, Manfred; Pedain, Josef; and Braden, Rudolf, 4,101,578, Cl. 260-563.00R.

Bradham, Allen C., III; and Seruga, Edward A., to Badger Meter, Inc. Compound meter assembly. 4,100,799, Cl. 73-197.000.

Bradley, Harry: *See*—
Ryan, Peter; and Bradley, Harry, 4,100,817, Cl. 74-111.000.

Braid, Milton; and Leonardi, Samuel J., to Mobil Oil Corporation. Lubricant compositions. 4,101,430, Cl. 252-42.700.

Brandes, Wilhelm: *See*—
Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, 4,101,575, Cl. 260-553.00E.

Branlard, Paul; and Merle, Jean Pierre, to Societe Distugil. Process for the manufacture of stable polychloroprene latex. 4,101,481, Cl. 260-23.70A.

Bratkowski, Walter V.: *See*—
Shoupp, William E.; and Bratkowski, Walter V., 4,101,792, Cl. 310-15.000.

Braun, Robert J.: *See*—
Lamont, James; and Braun, Robert J., 4,101,422, Cl. 210-84.000.

Breckenridge, Lloyd L., to Mobil Oil Corporation. Recovery of p-xylene and benzene from eight carbon atom aromatic fractions. 4,101,597, Cl. 260-668.00A.

Breedlove, Harold W.; and Brown, Walter L., to United States of America, Army. Test cell holder. 4,101,824, Cl. 324-20.00R.

Breitfeld, Gunter, to Volkswagenwerk Aktiengesellschaft. Vehicle safety belt apparatus. 4,101,091, Cl. 242-107.000.

Brejnik, Carl; and Whitlow, William T. Electronic calorie counter. 4,101,071, Cl. 235-92.0MT.

Bretthauer, Hans-Jurgen: *See*—
Focke, Heinz; and Bretthauer, Hans-Jurgen, 4,100,718, Cl. 53-234.000.

Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, to Robert Bosch GmbH. Apparatus for regulating the fuel-air mixture delivered to an internal combustion engine. 4,100,897, Cl. 123-119.0EC.

Bridenbaugh, Edwin Redmond, to International Telephone and Telegraph Corporation. Two-way loudspeaking device for telephone stations. 4,101,735, Cl. 179-1.0HF.

Bridgestone Tire Company Limited: *See*—
Takahashi, Takuya; and Ishigami, Masashi, 4,101,626, Cl. 264-313.000.

Brill, Alfred P., III, to Dow Corning Corporation. Low oiling gel filled flexible articles and gels therefor. 4,100,627, Cl. 3-36.000.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Partyka, Richard A., 4,101,548, Cl. 544-284.000.
Kavadias, Gerry; and Belleau, Bernard R., 4,101,556, Cl. 260-307.00C.
Samour, Carlos M.; and Vida, Julius A., 4,101,668, Cl. 424-275.000.

Bristol Products, Inc.: *See*—
Schoff, Dale H., 4,101,190, Cl. 339-113.00L.

Broach, George C.; and Thurman, Donald W., to G. C. Broach Company, The. Equipment and process involving combustion and air. 4,101,265, Cl. 432-29.000.

Broan Manufacturing Co., Inc.: *See*—
Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.

Brodsky, Philip H., to Monsanto Company. Brake lining compositions having friction particles of an aromatic amine modified novolac resin and an aromatic carboxylic compound. 4,101,500, Cl. 260-38.000.

Brody, Herbert M., to International Telephone & Telegraph Corporation. Multi-source heat pump HVAC system. 4,100,763, Cl. 62-238.000.

Brody, Philip S., to United States of America, Army. Optical memory with storage in three dimensions. 4,101,975, Cl. 365-117.000.

Broeg, Charles B.: *See*—
Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.

Broerse, Pieter Hendrik: *See*—
Wanninkhof, Markus Wilhelm Matthijs; van der Velden, Johnny Wilhelmus; and Broerse, Pieter Hendrik, 4,101,260, Cl. 431-95.00R.

Brookes, Neil Roger: *See*—
Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, 4,100,732, Cl. 60-39.360.

Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., to Monsanto Company. Durable fire retardant for forest and rangelands. 4,101,485, Cl. 260-29.4UA.

Brouard, Claude Marie Henri Emile: *See*—
Stiot, Jean-Pierre Henri; Brouard, Claude Marie Henri Emile; and Leroy, Jean Marie Louis, 4,101,543, Cl. 260-162.000.

Broune, Abel U. Transaction card. 4,100,689, Cl. 40-2.200.

Brown Boveri Corporation: *See*—
Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, 4,101,724, Cl. 13-1.000.

Brown, Dale M.; and Garfinkel, Marvin, to General Electric Company. Semiconductor radiation detector. 4,101,924, Cl. 357-30.000.

Brown, Gaylord William, to Sweetheart Plastic, Inc. Sheet support apparatus. 4,101,252, Cl. 425-394.000.

Brown, Ralph V.: *See*—
Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., 4,101,950, Cl. 361-203.000.

Brown, Walter L.: *See*—
Breedlove, Harold W.; and Brown, Walter L., 4,101,824, Cl. 324-20.00R.

Brown, William J.: *See*—
Ederati, Richard M.; and Brown, William J., 4,101,147, Cl. 280-775.000.

Browne, Robert E.: *See*—
Schooley, Willard A.; and Browne, Robert E., 4,101,424, Cl. 250-504.000.

Bruemmer, Joseph H.: *See*—
Baker, Robert A.; and Bruemmer, Joseph H., 4,101,678, Cl. 426-50.000.

Brunton Company, The: *See*—
Kramer, Melvin G., 4,101,882, Cl. 340-347.00P.

Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, to General Electric Company. Centrifugal compressor advanced dump diffuser. 4,100,732, Cl. 60-39.360.

Bryla, Theodore N.: *See*—
Poulin, Clyde J.; and Bryla, Theodore N., 4,101,352, Cl. 149-19.200.

BSP International Foundations Limited: *See*—
Elliott, Roger Michael, 4,100,977, Cl. 173-134.000.

Bubnich, Frank J.; and Bubnich, Marketta A. Vehicle parking guide and signaling device. 4,101,868, Cl. 340-51.000.

Bubnich, Marketta A.: *See*—
Bubnich, Frank J.; and Bubnich, Marketta A., 4,101,868, Cl. 340-51.000.

Buck, Stanley Edward, to Domtar Inc. Die cut tray. 4,101,068, Cl. 229-35.000.

Buckler, Ernest Jack; and Richmond, Michael Hugh, to Polysar Limited. Filled-polystyrene laminates. 4,101,050, Cl. 229-3.50R.

Bue, Richard C.; and Carlson, Casey L., to Sico Incorporated. Folding wall table. 4,100,858, Cl. 108-48.000.

Buendia, Jean: *See*—
Martel, Jacques; Huynh, Chanh; and Buendia, Jean, 4,101,574, Cl. 260-544.00L.

Buff, Grier E.; and Phillips, Talmadge V., to Republic Steel Corporation. Flash welding apparatus and method. 4,101,753, Cl. 219-97.000.

Bugaut, Andree: *See*—
Kalopissis, Gregoire; and Bugaut, Andree, 4,101,576, Cl. 260-559.00A.

Bu..ler-Miag GmbH: *See*—
Faist, Walter, 4,101,083, Cl. 241-285.00R.

Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, to Hoechst Aktiengesellschaft. Radiation-sensitive copying composition. 4,101,323, Cl. 96-35.000.

Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., to Texaco Inc. Shaped, bonded boride catalysts. 4,101,560, Cl. 260-348.290.

Buljan, Sergei-Tomislav, to GTE Sylvania Incorporated. Process for producing Si_3N_4 article. 4,101,616, Cl. 264-65.000.

Bunker Ramo Corporation: *See*—
Bauerle, Gerhard; and Hubner, Oswald, 4,101,192, Cl. 339-217.00S.

Buran, Ulrich: *See*—
Beyer, Horst; and Buran, Ulrich, 4,101,319, Cl. 75-252.000.

Burckhardt, Urs; Werthemann, Lucius; and Troxler, Richard Josef, to Ciba-Geigy Corporation. Process for the production of deoxy-alpha-acids. 4,101,585, Cl. 260-592.000.

Burger, Edward D., to Atlantic Richfield Company. Conveyor belt solids separator with combined scraper and gas jet control. 4,101,035, Cl. 209-114.000.

Burk, Bruce; and Burnett, Arthur P., to J. M. Ney Company, The. Leucite-containing porcelains and method of making same. 4,101,330, Cl. 106-45.000.

Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Catalyst demetallization utilizing a combination of reductive and oxidative washes. 4,101,444, Cl. 252-411.00R.

Burkhardt, Tilo; and Schonfelder, Manfred, to Bayer Aktiengesellschaft. Process for the production of polyisocyanate mixtures containing blocked isocyanate groups. 4,101,530, Cl. 528-45.000.

Burn, Ian, to Sprague Electric Company. Monolithic base-metal glass-ceramic capacitor. 4,101,952, Cl. 361-305.000.

Burnett, Arthur P.: *See*—
Burk, Bruce; and Burnett, Arthur P., 4,101,330, Cl. 106-45.000.

Burnett, Richard T., to Bendix Corporation, The. Drum brake with automatic adjustment. 4,101,010, Cl. 188-79.50P.

Burnett, Richard T., to Bendix Corporation, The. Drum brake adjuster. 4,101,011, Cl. 188-79.5GT.

Burroug..s Corporation: *See*—
Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, 4,101,960, Cl. 364-200.000.

Burzin, Klaus; and Feldmann, Rainer, to Chemische Werke Huls Aktiengesellschaft. Method for the production of colorless polyester amides. 4,101,524, Cl. 528-288.000.

Butcher, David Henry. Pressure-responsive transducer for regulating internal combustion engine. 4,100,893, Cl. 123-103.00B.

Butler, Anthony: *See*—
Coplin, John Frederick; Butler, Anthony; and Neal, Peter Frederick, 4,101,242, Cl. 415-134.000.

Butsch, Otto R., to Sycor, Inc. Drive spindle assembly for disc file. 4,101,945, Cl. 360-102.000.

Butterworth, Arthur L.; and Niedzwiecki, Joseph F., to Trane Company, The. Reciprocating refrigerant compressor valve arrangement. 4,100,934, Cl. 137-512.000.

Buxbaum, Lothar, to Ciba-Geigy Corporation. Process for the manufacture of linear polyesters which contain phosphites and/or phosphates. 4,101,526, Cl. 528-179.000.

Cachia, Josef M.: *See*—
Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, 4,101,093, Cl. 242-107.40A.

Cafarella, John H.: *See*—
Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., 4,101,965, Cl. 364-821.000.

Cahen, Raymond N. M.: *See*—
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,101,599, Cl. 260-683.900.

Calpis Shokuhin Kogyo Kabushiki Kaisha: *See*—
Kamada, Hidemoto; Miura, Chiaki; and Utena, Makoto, 4,101,683, Cl. 426-618.000.

Cam Industries, Inc.: *See*—
Sprague, Brinton, 4,101,758, Cl. 219-285.000.

Cameron, Larry D.; and Jacque, Albert W. Underwater protection device. 4,100,692, Cl. 42-1.00L.

Campbell, Alfred, to Warner-Lambert. New nonapeptides and methods for their production. 4,101,538, Cl. 260-112.5LH.

Campen, Harry E.: *See*—
Bianchi, Raymond A.; and Campen, Harry E., 4,101,177, Cl. 305-31.000.

Canon Kabushiki Kaisha: *See*—
Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, 4,101,912, Cl. 354-106.000.

Cape Boards & Panels Ltd.: *See*—
Barrable, Victor Ernest, 4,101,335, Cl. 106-99.000.

Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, to Commissariat a l'Energie Atomique. Sampling rod for corrosive gases or fumes in an incinerator, particularly when installed on a ship. 4,100,806, Cl. 73-421.50A.

Caretti, Robert: *See*—
Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.

Carl Still, Firma: *See*—
Tippmer, Kurt, 4,101,642, Cl. 423-573.00G.

Carlson, Casey L.: *See*—
Bue, Richard C.; and Carlson, Casey L., 4,100,858, Cl. 108-48.000.

Carlson, Fred E., to Raymond Lee Organization, Inc., The. Golf club anchor. 4,100,652, Cl. 24-3.00R.

Carlson, Ingemar. Solar energy heating apparatus. 4,100,915, Cl. 126-271.000.

Carlsson, Leif Ronny, to Telefonaktiebolaget L M Ericsson. Traveling wave tube with depressed collector power supply. 4,101,804, Cl. 315-3.500.

Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., to Clayson N.V. Grain tank and grain conveyor means of harvesting machines. 4,100,720, Cl. 56-14.600.

Carpenter Rigging and Supply Company, Inc.: *See*—
Martin, Bernard L.; and Vogel, Bruce N., 4,101,114, Cl. 254-134.3FT.

Carre, Jean-Jacques; and Meyer, Yves, to Societe Anonyme DBA. Braking correction device. 4,101,176, Cl. 303-6.00C.

Carrier Corporation: *See*—
Leonard, Louis H., 4,100,755, Cl. 62-2.000.

Carson, Craig Ronald: *See*—
Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, 4,101,455, Cl. 252-531.000.

Carter, Clarence F., to Carter Industries, Inc. Web forming apparatus. 4,100,949, Cl. 144-3.00R.

Carter, Clyde Thomas, to AMP Incorporated. Adjustable and expandable spool or reel assembly. 4,101,095, Cl. 242-115.000.

Carter Industries, Inc.: *See*—
Carter, Clarence F., 4,100,949, Cl. 144-3.00R.

Casio Computer Co., Ltd.: *See*—
Hakata, Masayuki, 4,101,962, Cl. 364-413.000.

Cassaigne, Raoul Louis Andre: *See*—
Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.

Castaneda, Ernesto G. Shopping cart theft-control apparatus. 4,101,234, Cl. 404-6.000.

Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, to International Business Machines Corporation. Frequency selective optical data storage system. 4,101,976, Cl. 365-119.000.

Catenacci, Gerald Anthony. Method of slip-forming roadbeds and apparatus therefor. 4,101,237, Cl. 404-98.000.

Caterpillar Tractor Co.: *See*—
Bianchi, Raymond A.; and Campen, Harry E., 4,101,177, Cl. 305-31.000.
Ederati, Richard M.; and Brown, William J., 4,101,147, Cl. 280-775.000.
Fischer, Robert L., 4,100,951, Cl. 144-309.0AC.
Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., 4,101,251, Cl. 417-313.000.
Mounts, William T.; and Stratton, Joseph B., 4,101,160, Cl. 296-35.00R.
Palma, Milton J., 4,101,038, Cl. 214-44.00R.
Shaffer, Walter Moore, 4,100,739, Cl. 60-413.000.
Stedman, Robert N., 4,100,990, Cl. 180-135.000.
Straesser, Chris Robert, 4,100,664, Cl. 29-156.600.

Cech, Theo. Striker cartridge. 4,100,693, Cl. 42-1.00N.

Celanese Corporation: *See*—
Costanza, John R.; and Collins, George L., 4,101,399, Cl. 204-159.190.
Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.
Hwang, H. Shinn; and Taylor, Paul D., 4,101,450, Cl. 252-460.000.
Poist, John E., 4,101,564, Cl. 260-429.700.
Poist, John E., 4,101,565, Cl. 260-429.700.
Thomas, Norman W., 4,101,601, Cl. 260-836.000.

Cenci, Harry J.; and Swift, Graham, to Rohm and Haas Company. Method for curing polymers containing one or more carboxy or anhydride functions by means of polymers having hydroxyamide groups, and compositions. 4,101,606, Cl. 260-857.0UN.

Cerwin Vega, Inc.: *See*—
Czerwinski, Eugene J., 4,101,736, Cl. 179-1.00E.

Chaffin, John D. Earth boring apparatus for geological drilling and coring. 4,100,981, Cl. 175-60.000.

Champenois, Michel Maurice Luce, to Produits Chimiques Ugine Kuhlmann. Dyed polymers and copolymers having a cyanovinyl-azo dye incorporated in the structure thereof. 4,101,269, Cl. 8-4.000.

Champion International Corporation: *See—*
Stillman, Nathan, 4,101,711, Cl. 428-474.000.
Champion Products Inc.: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,101,685, Cl. 427-8.000.
Chang, Bansun. Zoom operating light. 4,101,957, Cl. 362-268.000.
Chang, Moon Ki. Novel reagent and method for the determination of urea in biological fluids. 4,101,382, Cl. 195-103.5UR.
Chang, Stephen S., to Vitrum AB. Purification of nutritive oils. 4,101,673, Cl. 424-312.000.
Chas. S. Tanner Co.: *See—*
Lindemann, Martin K.; and Wacome, Donald M., 4,101,492, Cl. 260-29.6NR.
Charves, Everett; Pulley, David F.; and Stander, Arthur O., to United States of America, Navy. Sealant-primer coating. 4,101,497, Cl. 260-31.20N.
Chatchenko, Sergei Grigorievich: *See—*
Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich, 4,100,708, Cl. 52-222.000.
Chayes, Norman Chanine, to Combustion Engineering, Inc. Band type tube support. 4,100,889, Cl. 122-510.000.
Chazard, Georges: *See—*
Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, 4,101,456, Cl. 252-551.000.
Cheak, Edward G., to Norfield Manufacturing Co.,. Door hinge applying apparatus. 4,100,661, Cl. 29-33.00K.
Chemed Corporation: *See—*
Hwa, Chih Ming; and Jacob, Jose T., 4,101,441, Cl. 252-389.00A.
Chemische Werke Huls Aktiengesellschaft: *See—*
Burzin, Klaus; and Feldmann, Rainer, 4,101,524, Cl. 528-288.000.
Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, 4,101,496, Cl. 260-31.20R.
Chen, Nai Y.; and Reagan, William J., to Mobil Oil Corporation. Conversion of ethyl benzene to para xylene. 4,101,595, Cl. 260-668.00A.
Cheney, Paul L. Fluid suspension freezer and method. 4,100,760, Cl. 62-57.000.
Chenin, Claude: *See—*
Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.
Chessin, Hyman; and Seyb, Edgar J., Jr., to M & T Chemicals Inc. Prevention of anode bag clogging in nickel iron plating. 4,101,388, Cl. 204-43.00T.
Chevalier, Gerard: *See—*
Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, 4,100,806, Cl. 73-421.50A.
Chevron Research Company: *See—*
Bacskai, Robert, 4,101,447, Cl. 252-431.00C.
Bacskai, Robert, 4,101,531, Cl. 528-315.000.
Crawford, John, 4,101,428, Cl. 252-32.70E.
MacFadden, Donald L., 4,101,679, Cl. 426-53.000.
Wedel, Carroll J., 4,101,479, Cl. 260-23.00H.
Chien, Sze-Foo: *See—*
Allen, Joseph C.; and Chien, Sze-Foo, 4,100,967, Cl. 166-68.000.
Chilton, Robert S. Carburetor heater. 4,100,899, Cl. 123-122.00A.
Chloride, Incorporated: *See—*
Malinowski, William J., 4,101,785, Cl. 250-574.000.
Choi, Charles K., to Occidental Petroleum Corporation. Process and apparatus for rapid pyrolysis of carbonaceous materials. 4,101,412, Cl. 208-8.000.
Christe, Karl O., to Rockwell International Corporation. Production of OH_3^{30} salts. 4,101,640, Cl. 423-462.000.
Christensen, Craig M., to Noctua, Inc. Radiation beam splitter. 4,101,199, Cl. 350-152.000.
Chromalloy American Corporation: *See—*
Hodgson, James H., 4,101,078, Cl. 239-651.000.
Churchill, Geoffrey B.; and White, J. Craig, to Monsanto Company. Composite sheet member having a plurality of coextruded laminar layers. 4,101,702, Cl. 428-213.000.
Ciba-Geigy AG: *See—*
Renner, Alfred, 4,101,521, Cl. 528-242.000.
Ciba-Geigy Corporation: *See—*
Andrews, Christopher Michael, 4,101,459, Cl. 260-18.0EP.
Burckhardt, Urs; Werthemann, Lucius; and Troxler, Richard Josef, 4,101,585, Cl. 260-592.000.
Buxbaum, Lothar, 4,101,526, Cl. 528-179.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,101,672, Cl. 424-301.000.
Petitpierre, Jean Claude; and Ramanathan, Visvanathan, 4,101,541, Cl. 260-158.000.
Ramey, Chester E.; and Luzzi, John J., 4,101,509, Cl. 260-45.75N.
Schmid, Rolf; and Kreibich, Ursula, 4,101,476, Cl. 260-22.0EP.
Spivack, John D., 4,101,550, Cl. 544-387.000.
Cicatelli, Rodolfo, to Autovox S.p.A. Single control key for tape recorders. 4,101,949, Cl. 360-137.000.
Citizen Watch Company Limited: *See—*
Ebihara, Heichachiro; and Yamada, Takashi, 4,101,790, Cl. 307-221.00C.
City Tank Corporation: *See—*
Stewart, Melvin E., 4,100,740, Cl. 60-431.000.
Clamp-All Corp.: *See—*
Ferguson, Harry J. S., 4,101,151, Cl. 285-236.000.
Clancy, John J.; and Wells, Robert C., to Arthur D. Little, Inc. Method of forming a porous shaped body capable of retaining liquids therein. 4,100,853, Cl. 101-401.100.
Clapot, Claude; Dumont, Louis; and Vial, Jean, to Philagro S.A. Methional derivatives and compositions with a growth-regulating effect upon plants. 4,101,307, Cl. 71-88.000.
Clark, Alexander B., Jr. Fork lift pallet. 4,100,859, Cl. 108-51.300.
Clark, Judith Ann, to Beecham Group Limited. Diphenylpropylamines to treat depression. 4,101,676, Cl. 424-330.000.
Clark, Malcolm D. Manual control apparatus. 4,100,816, Cl. 74-89.140.
Clark, Morris E.: *See—*
Larson, Harold V.; and Clark, Morris E., 4,101,636, Cl. 423-305.000.
Clark, Ross Ruel: *See—*
Craig, Edwin D.; and Clark, Ross Ruel, 4,101,742, Cl. 179-100.10C.
Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, to Schering Aktiengesellschaft. Oral dosage form for X-ray contrast media containing a pharmaceutically acceptable base and method of use thereof. 4,101,647, Cl. 424-5.000.
Clay, Robert A. Shot peening process. 4,100,782, Cl. 72-53.000.
Clayson N.V.: *See—*
Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 4,100,720, Cl. 56-14.600.
Clayton, Lorimer, Jr.; and Livaditis, Elias J., to Scientific-Atlanta, Inc. Threshold extension FM demodulator apparatus for wide band width FM signals. 4,101,837, Cl. 325-347.000.
Clemar Manufacturing Corporation: *See—*
Ruggles, Richard L.; and Panday, Vinod, 4,101,786, Cl. 307-38.000.
Clemmer Industries (1964) Limited: *See—*
Meyers, Earl, 4,100,645, Cl. 16-2.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.
CMB Colonia Management und Beratungsgesellschaft mbH & Co. KG: *See—*
Fricke, Jobst; and Reuter, Helmut, 4,101,840, Cl. 330-127.000.
Coal Industry (Patents) Limited: *See—*
Hodgkinson, John Hedley, 4,101,173, Cl. 299-33.000.
Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, 4,101,413, Cl. 208-8.000.
Cohen, Nathan. Device for preventing unintended unlocking of automobile car doors. 4,101,155, Cl. 292-347.000.
Coispeau, Gerard Emile Edgard, to Produits Chimiques Ugine Kuhlmann. 3-Trifluoromethyl-4-phenyl-pyrazolium azo dyestuffs. 4,101,540, Cl. 260-147.000.
Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, to Allied Chemical Corporation. Friction dampened pendulum sensor. 4,101,093, Cl. 242-107.40A.
Cole, Bryon M.: *See—*
Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., 4,101,959, Cl. 364-200.000.
Colein, Bernard Albert Victor: *See—*
Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.
Colgate-Palmolive Company: *See—*
Bonk, Joseph P., 4,101,026, Cl. 206-205.000.
Hernandez, John Michael, 4,100,922, Cl. 128-284.000.
Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, 4,101,456, Cl. 252-551.000.
Schaar, Charles H., 4,100,921, Cl. 128-284.000.
Collier, Ben C. Socket for wedge base bulbs. 4,101,187, Cl. 339-59.00L.
Collin, David Trevor: *See—*
Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,101,579, Cl. 260-559.00R.
Collins, Floyd K., to GTE Sylvania Incorporated. Shielded cathode support structure. 4,101,801, Cl. 313-417.000.
Collins, George L.: *See—*
Costanza, John R.; and Collins, George L., 4,101,399, Cl. 204-159.190.
Colville, William T.: *See—*
Shaffer, John W.; Mecone, David W.; and Colville, William T., 4,101,259, Cl. 431-93.000.
Combustion Engineering, Inc.: *See—*
Chayes, Norman Chanine, 4,100,889, Cl. 122-510.000.
Combustion Unlimited Incorporated: *See—*
Straitz, John F., III, 4,101,257, Cl. 431-15.000.
Straitz, John F., III, 4,101,261, Cl. 431-202.000.
Commissariat a l'Energie Atomique: *See—*
Berniolles, Jean-Marie; and Jogand, Patrick, 4,101,377, Cl. 176-40.000.
Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, 4,100,806, Cl. 73-421.50A.
d'Andrea, Felix; and Minjolle, Louis, 4,100,881, Cl. 118-319.000.
Hilaire, Pierre; and Lonchampt, Georges, 4,101,407, Cl. 204-251.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Guise, Geoffrey Bruce; and Jones, Francis William, 4,101,272, Cl. 8-127.600.
Communications Satellite Corporation: *See—*
Uzunoglu, Vasil, 4,101,966, Cl. 364-841.000.
Compagnie des Etablissements de la Risle-Papeteries de Pont-Audemer: *See—*
Failliot, Olivier, 4,101,359, Cl. 156-179.000.
Compagnie Generale des Etablissements Michelin: *See—*
Durand, Pierre, 4,101,717, Cl. 429-15.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.

Concorde Fibers, Inc.: *See—*
Norwood, David, 4,101,613, Cl. 264-40.300.

Conner, Joe Derrell. Deer hunting stand attachment. 4,100,999, Cl. 182-122.000.

Conners, John A.; and Posner, Hyman. Pipe line coupling system. 4,101,112, Cl. 251-148.000.

Connors, Robert H.: *See—*
Klopfenstein, King L.; and Connors, Robert H., 4,100,984, Cl. 177-50.000.

Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., to Conrey, Richard N.; and McQuaid, Phillip T. Electronic athletic equipment. 4,101,132, Cl. 273-29.00A.

Conroy, Richard F. M.: *See—*
Smith, Jay, III; and Conroy, Richard F. M., 4,101,134, Cl. 274-23.00R.
Smith, Jay, III; and Conroy, Richard F. M., 4,101,135, Cl. 274-39.00A.

Constien, Vernon G.: *See—*
Copeland, Claude T.; and Constien, Vernon G., 4,101,474, Cl. 260-13.000.

Continental Oil Company: *See—*
Miller, Thomas R., 4,101,174, Cl. 302-11.000.

Contour Chair-Lounge Co., Inc.: *See—*
Ferro, Arthur Charles, 4,101,168, Cl. 297-329.000.

Contronic Controls Limited: *See—*
Humphries, Peter E., 4,101,875, Cl. 340-504.000.

Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., to Marvin Glass & Associates. Method of making a doll head. 4,101,619, Cl. 264-156.000.

Cook, James A.: *See—*
Goetsch, Henry E.; Cook, James A.; and Armstrong, Lee R., 4,100,793, Cl. 73-118.000.

Coombes, Michael: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.

Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. Compositions of a polyphenylene ether resin and high molecular weight alkenyl aromatic resins modified with EPDM rubber. 4,101,503, Cl. 260-42.180.

Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. High impact compositions of a polyphenylene ether resin and alkenyl aromatic resins modified with EPDM rubber. 4,101,504, Cl. 260-42.180.

Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. Compositions of a polyphenylene ether resin and EPDM rubber-modified alkenyl aromatic resins having specified gel content. 4,101,505, Cl. 260-42.180.

Copeland, Claude T.; and Constien, Vernon G., to Dow Chemical Company, The. Aqueous based epoxy slurry for forming a consolidated gravel pack. 4,101,474, Cl. 260-13.000.

Coplin, John Frederick; Butler, Anthony; and Neal, Peter Frederick, to Rolls-Royce Limited. Matching thermal expansion of components of turbo-machines. 4,101,242, Cl. 415-134.000.

Copper Range Company: *See—*
Mattila, Eugene W.; and Maher, Joseph M., 4,101,141, Cl. 279-19.000.

Corbett, John M.: *See—*
Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., 4,101,467, Cl. 521-79.000.

Corll, James A. Exercising apparatus. 4,101,136, Cl. 272-97.000.

Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, to Metallgesellschaft Aktiengesellschaft. Tubular heater for cracking hydrocarbons. 4,101,376, Cl. 176-39.000.

Corrigan, John H. Treatment of commodities through contact with fluid media. 4,100,682, Cl. 34-22.000.

Corsaro, Vincent A.; and Gutbier, Ernst A., to Western Electric Co., Inc. Soldering method and apparatus utilizing dual solder waves of different variable velocities. 4,101,066, Cl. 228-180.00R.

Cossin, George E. Settling basin sampler. 4,100,805, Cl. 73-421.00B.

Costanza, John R.; and Collins, George L., to Celanese Corporation. Production of solvent resistant brominated and/or chlorinated aromatic polyester fibrous materials. 4,101,399, Cl. 204-159.190.

Costes, Michel Leon; and Hoyle, James Franklin, to International Business Machines Corporation. Test circuit for a protective coupler. 4,101,743, Cl. 179-175.000.

Coudreuse, Michel: *See—*
Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, 4,101,738, Cl. 179-15.0FD.

Coupek, Jiri: *See—*
Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.

Cox, Calvin Howard, to Bell-Fruit Manufacturing Company Limited. Gaming machines. 4,101,129, Cl. 273-143.00R.

CPC International Inc.: *See—*
Edwards, Larry W., 4,101,680, Cl. 426-96.000.

Craig, Edwin D.; and Clark, Ross Ruel, to Craig, Edwin D. Audio message system with programmer. 4,101,742, Cl. 179-100.10C.

Craig, Paul M. Support column with ceiling thrusters. 4,101,036, Cl. 211-86.000.

Craig, Timothy Philip; and Stimple, James Roy, to Motorola, Inc. Sectored antenna receiving system. 4,101,836, Cl. 325-302.000.

Crain, Harry M.: *See—*
Poole, Lynn A.; and Crain, Harry M., 4,101,839, Cl. 328-165.000.

Crane, Roy B., to Keene Corporation. Fluorescent fixture. 4,101,956, Cl. 362-217.000.

Crawford, John, to Chevron Research Company. Composition comprising a mixture of the zinc salts of O,O-di(primary and secondary) alkyldithiophosphoric acids. 4,101,428, Cl. 252-32.70E.

Crenshaw, Ronnie R.; and Partyka, Richard A., to Bristol-Myers Company. 1,2,3-Thiadiazole amides. 4,101,548, Cl. 544-284.000.

Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, to Oxy Metal Industries Corporation. Composition for electrodeposition of metal deposits, its method of preparation and uses thereof. 4,101,387, Cl. 204-43.00T.

Crewe, Albert V.: *See—*
Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., 4,101,813, Cl. 315-370.000.

Crews, Michael R.; and Thiele, Gary A., to United States of America, Navy. Modified T-bar fed slot antenna. 4,101,900, Cl. 343-789.000.

Cromie, Harry W., to Medical Engineering Corp. Package for prosthetic heart valve or the like. 4,101,031, Cl. 206-438.000.

Crossley, William James: *See—*
Sanders, Richard Norman; and Crossley, William James, 4,101,930, Cl. 358-183.000.

Crowe, Sam R.: *See—*
Gray, Tommy L.; and Crowe, Sam R., 4,100,812, Cl. 73-732.000.

Crowley, Ralph P., to Phillips Petroleum Company. Solvent deasphalting. 4,101,415, Cl. 208-45.000.

Crum, James R. Carburetor, kit and tool for use therein. 4,100,663, Cl. 29-156.40R.

CTS Corporation: *See—*
Van Benthuysen, John D., 4,101,864, Cl. 338-183.000.

Culbertson, Richard; and Klucznik, Paul J., to General Electric Company. Integral storage assembly for detachable power cords. 4,101,089, Cl. 242-85.100.

Cullen, Donald E.; and Reeder, Thomas M., to United Technologies Corporation. Differential surface acoustic wave transducer. 4,100,811, Cl. 73-654.000.

Cummins Engine Company, Inc.: *See—*
Timour, Sune E.; and Littrell, Thomas D., 4,101,003, Cl. 184-106.000.

Cunningham, Arthur L.; and Mathai, John, to Sherwin-Williams Company, The. Moisture curing polymers prepared from polyfunctional isocyanates and a dioxazabicyclo octane. 4,101,527, Cl. 528-73.000.

Cupery, Willis Eli: *See—*
Baude, Frederic John; and Cupery, Willis Eli, 4,101,669, Cl. 424-286.000.

Currall, John Josiah, to Weathershields Limited. Opening roof assemblies for vehicles. 4,101,161, Cl. 296-137.00H.

Curran, James Hall, to Spray Engineering Company. Two-fluid spray nozzle producing fine atomization of liquid. 4,101,073, Cl. 239-14.000.

Cuscurida, Michael; and Speranza, George P., to Texaco Development Corp. Urethane catalyst. 4,101,462, Cl. 521-115.000.

Cutler-Hammer, Inc.: *See—*
Josemans, Leonardus J.; and Swessel, John A., Jr., 4,101,749, Cl. 200-317.000.

Cyprus Metallurgical Processes Corporation: *See—*
Peters, Mark A.; and Johnson, Robert K., 4,101,315, Cl. 75-104.000.

Cyran, Robert E.: *See—*
Solovieff, Paul G.; and Cyran, Robert E., 4,100,774, Cl. 70-380.000.

Czechoslovenska akademie ved: *See—*
Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.

Czerwinski, Eugene J., to Cerwin Vega, Inc. Device for increasing the compliance of a speaker enclosure. 4,101,736, Cl. 179-1.00E.

Dahlstrom, Mark Sorensen; and Simon, Paul, to International Business Machines Corporation. Charge electrode assembly for ink jet printer. 4,101,906, Cl. 346-75.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.

Dalton, Richard K.: *See—*
White, Roger L.; and Dalton, Richard K., 4,101,256, Cl. 425-441.000.

d'Andrea, Felix; and Minjolle, Louis, to Commissariat a l'Energie Atomique. Apparatus for applying a covering on heat-sensitive articles by means of a blowpipe. 4,100,881, Cl. 118-319.000.

Dandrel, Francois; and Bouvier, Jean-Pierre. Delayed extinction control. 4,101,811, Cl. 315-200.00R.

Dano, Tage Halfdan, to F. L. Smidth & Co. Cement manufacture. 4,101,337, Cl. 106-101.000.

Danti, Bernard R.: *See—*
Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., 4,101,423, Cl. 210-494.00M.

Dao, Tich T., to Signetics Corporation. Binary to multistate bus driver, receiver and method. 4,101,734, Cl. 178-68.000.

Dassler, Adolf. Sports shoe. 4,100,685, Cl. 36-3.00B.

Davern, John W.: *See—*
Vargo, Joseph, Jr.; and Davern, John W., 4,101,064, Cl. 227-53.000.

Davey, John T.; and Kahn, Lawrence P., to Seco Manufacturing, Inc. Fire protection water supply valve. 4,100,933, Cl. 137-495.000.

Davis, Bill G., to Jetco, Inc. Pressure ratio valve. 4,100,910, Cl. 123-196.00S.

Davis, Farris L., to Bear Brand Hosiery Co. Method and apparatus for forming a combination garment and products thereof. 4,100,624, Cl. 2-409.000.

Davis, Gerald L.; and Scott, Timothy C., to Sundstrand Corporation. Integrated controls assembly. 4,100,762, Cl. 62-160.000.

Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., to Celanese Corporation. Polyester yarn of high strength possessing an unusually stable internal structure. 4,101,525, Cl. 528-309.000.

Davis, Howard C.: *See*—
Trumbull, Harold E.; Davis, Howard C.; and Yano, Robert A., 4,100,743, Cl. 60-639.000.

Davis, William F.; and Pace, Wilson David, to Motorola, Inc. Start-to-run circuit for an electronic ignition system. 4,100,907, Cl. 123-148.00S.

Davison, Sol: *See*—
Gergen, William P.; and Davison, Sol, 4,101,605, Cl. 260-873.000.

Daxinger, Helmut, to Balzers Patent-und Beteiligungs-Aktiengesellschaft. Coating composition for a light transmitting absorbing coating on substrates. 4,101,200, Cl. 350-166.000.

Day, Clive Richard: *See*—
Midwinter, John Edwin; and Day, Clive Richard, 4,101,305, Cl. 65-145.000.

Dazey Products Co.: *See*—
Talge, Henry J.; McNair, Samuel L.; and Zugenbuhler, Verne L., 4,100,917, Cl. 128-66.000.

DBX, Inc.: *See*—
Blackmer, David E.; and Jaeger, C. Rene, 4,101,849, Cl. 333-14.000.

Deabriges, Jean: *See*—
Mercier, Henri; Magrone, Robert; and Deabriges, Jean, 4,101,629, Cl. 423-121.000.

Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., to Labofina S.A. Hydrogenation process of olefin polymers for producing white oils. 4,101,599, Cl. 260-683.900.

DeBoise, Thomas W.: *See*—
Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., 4,101,288, Cl. 23-288.00B.

Decoene, Frans J. G. C.: *See*—
Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 4,100,720, Cl. 56-14.600.

Deeg, Emil W.: *See*—
Krohn, David A.; and Deeg, Emil W., 4,101,302, Cl. 65-30.00R.

Deem, Mary Lease; and Stueben, Kenneth Charles, to Union Carbide Corporation. Aldol reactions with bifunctional co-catalysts. 4,101,586, Cl. 260-593.00R.

Deere & Company: *See*—
Honnold, Darrel Lee, 4,100,971, Cl. 172-547.000.

De Freitas, Richard E., to Hybrid Systems Corporation. Multiple state responsive delta-sigma converter and delay line. 4,101,881, Cl. 340-347.00R.

Dehler, William H., to Boeing Company, The. Corrosion detector. 4,101,828, Cl. 324-65.00R.

Delano, Charles George. Technique for running casing. 4,100,968, Cl. 166-315.000.

Delecourt, Robert Louis Felix: *See*—
Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.

DeLuca, John P.: *See*—
Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, 4,101,287, Cl. 23-288.00K.

DeMarinis, Robert M.; and Weisbach, Jerry A., to SmithKline Corporation. Cephamycins as antibacterial agents. 4,101,657, Cl. 424-246.000.

Demchuk, Alexandr Fedorovich: *See*—
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Demizu, Hiromi: *See*—
Mochizuki, Nobuo; and Demizu, Hiromi, 4,100,884, Cl. 118-653.000.

De Munari, Delio. Installation for the production of energy which utilizes a source of heat or natural thermic differences in level. 4,100,744, Cl. 60-651.000.

Demyanets, Vladimir Grigorievich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Deneke, Ulfert: *See*—
Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.

Denison, Dean R.; and Kren, George J., to Perkin-Elmer Corporation, The. Fluid flow indicator and flow switch. 4,101,874, Cl. 340-606.000.

Denkinger, Marian C.; and Batova, Kemal. Cushion leveler for tables and chairs. 4,101,106, Cl. 248-188.900.

Dennstadt, Heinz; and Baum, Walter, to USM Corporation. Continuous leather processing machine. 4,100,772, Cl. 69-47.000.

Depoutot, Michel: *See*—
Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.

Deribas, Andrei Andreevich: *See*—
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Derrick, Danny O'Brian: *See*—
Ruff, George Robert; and Derrick, Danny O'Brian, 4,100,668, Cl. 29-523.000.

Desai, Arvind: *See*—
Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 4,101,645, Cl. 423-648.00A.

Destron, Inc.: *See*—
Stone, David E., 4,101,805, Cl. 315-74.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Automatic digital circuit for generating chords in a digital organ. 4,100,831, Cl. 84-1.010.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See*—
Kruger, Manfred; Schreyer, Gerd; and Weiberg, Otto, 4,101,570, Cl. 260-502.00R.

Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,101,591, Cl. 260-649.00F.

Diana, Silvio. Precast building structure. 4,100,705, Cl. 52-82.000.

DiCenzo, Guy J. Shelving structure. 4,101,105, Cl. 248-158.000.

Diederich, Gerd: *See*—
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.

Dieffenbach, Percy; and Zon, Louis, to American Technical Industries, Inc. Cone like sheet for Christmas tree. 4,101,697, Cl. 428-9.000.

Diehl, Robert Eugene: *See*—
Lutz, Albert William; and Diehl, Robert Eugene, 4,101,582, Cl. 260-574.000.

Diesel Kiki Co., Ltd.: *See*—
Mori, Koichi, 4,100,890, Cl. 123-140.00R.

Dietrich, Gunter, to Rahdener Maschinenfabrik August Kolbus. Methods of an apparatus for wrapping jackets around books. 4,100,639, Cl. 11-1.00R.

Dietrich, Walter; and Bauer, Manfred, to Robert Bosch GmbH. Method and apparatus for erecting folded blanks. 4,100,843, Cl. 93-53.00M.

Difiglio, Joseph J.; and George, Richard W., to Abbott Laboratories. Multiple bead dispenser for diagnostic assay. 4,101,284, Cl. 23-259.000.

Digital Equipment Corporation: *See*—
Lawson, Roger E.; and Richesson, Maurice A., 4,101,969, Cl. 364-900.000.

Dillenbeck, Warren H. Heat exchange system. 4,100,963, Cl. 165-17.000.

Dimensional Development Corporation: *See*—
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,101,210, Cl. 353-7.000.

Dischert, Robert Adams; Banks, Arthur James; and Hopkins, Robert Sherman, Jr., to RCA Corporation. Television synchronizing apparatus. 4,101,926, Cl. 358-17.000.

Doane, Tuthill. Portable camp stove. 4,100,912, Cl. 126-43.000.

Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG: *See*—
Ulbrich, Horst, 4,101,648, Cl. 424-9.000.

Dr. Johannes Heidenhain GmbH: *See*—
Nelle, Gunther, 4,101,764, Cl. 250-237.00G.

Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung vorm. Otto Louis Herberts: *See*—
Patzschke, Hans-Peter; and Gobel, Armin, 4,101,495, Cl. 260-29.7NR.

Dokoupil, Jiri. Method and apparatus for flexibilizing leather. 4,100,771, Cl. 69-33.000.

Dolbear, Geoffrey E., to Occidental Petroleum Corporation. Process for hydrogenation of hydrocarbon tars. 4,101,416, Cl. 208-108.000.

Dolomanov, Ljudvig Alexandrovich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., to Informer, Inc. Terminal display and storage system. 4,101,959, Cl. 364-200.000.

Domtar Inc: *See*—
Buck, Stanley Edward, 4,101,068, Cl. 229-35.000.

Doner, John T., to Whirlpool Corporation. Door interlock system for microwave oven. 4,101,750, Cl. 219-10.55C.

Donnelly, James E.: *See*—
Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., 4,100,791, Cl. 73-37.700.

Dooley, Joseph: *See*—
Masson, John Richard; and Dooley, Joseph, 4,101,684, Cl. 426-625.000.

Doolin, Wendell M.: *See*—
Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., 4,100,961, Cl. 164-180.000.

Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, to Chemische Werke Huls Aktiengesellschaft. Highly pigmentable, liquid coating compositions. 4,101,496, Cl. 260-31.20R.

Dorp, Walter Vom; Ritter, Hans Georg; and Witteck, Fritz, to Mannes-

mann Aktiengesellschaft. Feed mechanism for pilger rolling mills. 4,100,786, Cl. 72-252.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Protective hydrophobic and oleophilic coating for aluminum products. 4,101,346, Cl. 148-6.270.

Doss, Daniel L.; and Melander, Robert A., to Owatonna Tool Company. Instrument for testing a breakerless ignition system. 4,101,822, Cl. 324-16.00R.

Doss, Richard C.; and Walton, Edward L., to Phillips Petroleum Company. Sealant based on mixture of unsaturated and hydrogenated block copolymers. 4,101,482, Cl. 260-27.0BB.

Doss, Richard C., to Phillips Petroleum Company. Sealant based on thermoplastic elastomer and mixed modifying resins. 4,101,484, Cl. 260-27.0BB.

Dotzer, Richard; and Stoger, Klaus, to Siemens Aktiengesellschaft. Methods of coating and surface finishing articles made of metals and their alloys. 4,101,386, Cl. 204-32.00R.

Doub, Leonard: *See—*
Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, 4,101,661, Cl. 424-266.000.

Dove, Douglas J. A., to Interstore Transfer Specialists, Inc. Containers for transferring merchandise between distribution service centers and retail stores, while security sealed in either an expanded or a reduced volume configuration. 4,101,052, Cl. 229-23.00R.

Dow Chemical Company, The: *See—*
Copeland, Claude T.; and Constien, Vernon G., 4,101,474, Cl. 260-13.000.
Frenier, Wayne W.; and Settineri, William J., 4,101,438, Cl. 252-151.000.
Frevel, Ludo K.; and Kressley, Leonard J., 4,101,451, Cl. 252-465.000.
Havens, Carl B., 4,101,614, Cl. 264-40.600.
Mixan, Craig E.; and Goralski, Christian T., 4,101,546, Cl. 544-408.000.
Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., 4,101,467, Cl. 521-79.000.
Small, Hamish; and Stevens, Timothy S., 4,101,460, Cl. 521-28.000.

Dow Corning Corporation: *See—*
Brill, Alfred P., III, 4,100,627, Cl. 3-36.000.

Dowa Mining Co., Ltd.: *See—*
Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, 4,101,286, Cl. 23-283.000.

Dozier, Donald P. Quick opening lock assembly for doors and method. 4,101,153, Cl. 292-92.000.

Drapaljuk, Vladislav Vitalievich: *See—*
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Drapeau, Donald R., to Hi-G Incorporated. Miniature relay. 4,101,855, Cl. 335-106.000.

Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., to Wehr Corporation. Flow control unit for air distribution system. 4,100,938, Cl. 137-625.310.

Dresser Industries, Inc.: *See—*
Barnes, Casper W., Jr., 4,100,927, Cl. 137-9.000.

Driesen, Gerard M. V.: *See—*
Gomperts, Robert J.; and Driesen, Gerard M. V., 4,101,829, Cl. 324-126.000.

Drozdov, Jury Anatolievich: *See—*
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Druzhaev, Jury Avraamovich: *See—*
Bobrov, Vladimir Timofeevich; Druzhaev, Jury Avraamovich; and Lebedeva, Nelli Alexandrovna, 4,100,809, Cl. 73-638.000.

DSO "Cherna Metalurgia": *See—*
Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, 4,101,186, Cl. 339-5.00S.

Dubodin, Vissarion Makarovich: *See—*
Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich, 4,101,725, Cl. 13-18.000.

Duffy, Richard J.; and Rodden, Philip J., to USM Corporation. Apparatus for making locking nuts. 4,100,882, Cl. 118-620.000.

Dumbeck, Robert F., to Rexnord Inc. Load monitoring apparatus and method. 4,101,831, Cl. 324-166.000.

Dumont, Louis: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,101,307, Cl. 71-88.000.

DuNah, Richard E., to Precision Lamp. Ornamental article with illuminated display. 4,101,955, Cl. 362-104.000.

Duncan, Robert, to Westinghouse Electric Corp. Process for welding corner cells in fuel assembly grids. 4,101,752, Cl. 219-91.200.

Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, to Abbott Laboratories. Aminotetralins and use in inducing anesthesia. 4,101,677, Cl. 424-330.000.

Dunning, Richard E.; and Rampelberg, Victor H., to Avery International Corp. Elastomeric reflective metal surfaces. 4,101,698, Cl. 428-31.000.

Du Pont de Nemours, E. I., and Company: *See—*
Baude, Frederic John; and Cupery, Willis Eli, 4,101,669, Cl. 424-286.000.
Larry, John Robert, 4,101,708, Cl. 428-432.000.
Magel, Bernard, 4,100,725, Cl. 57-140.00J.
Marcus, Sanford Morton, 4,101,710, Cl. 428-472.000.
Ochomogo, Oscar Rene, 4,101,308, Cl. 71-93.000.
Smathers, Donald Lee, 4,101,577, Cl. 260-561.00R.
Titone, Simone Charles, 4,100,770, Cl. 66-193.000.

Durand, Francois. Hydrostatic braking device for vehicles running downhill. 4,101,012, Cl. 188-290.000.

Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Electrochemical generators with a sedimentation bed and divergent feed. 4,101,717, Cl. 429-15.000.

Duriez, Jean; and Evin, Jean. Process for the control and regulation of the speed of a mobile. 4,101,013, Cl. 187-29.00R.

Durkin, Joseph A.: *See—*
Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., 4,101,560, Cl. 260-348.290.

Durr, Ernst, to Kolle, Fritz. Electrical switching relay construction and housing therefor. 4,101,856, Cl. 335-135.000.

Dutton, John P.: *See—*
Zawacki, Joseph H.; and Dutton, John P., 4,100,781, Cl. 72-41.000.

Dvorak, Jarda: *See—*
Kober, Marvin; and Dvorak, Jarda, 4,100,670, Cl. 29-564.100.

Dworsky, Lawrence Noah; and Whalin, Jeffery Alden, to Motorola, Inc. UHF isolator using stacked conductor sheets. 4,101,850, Cl. 333-24.200.

Dyachkovsky, Fridrikh Stepanovich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

Dyadjunova, Maria Nikolaevna: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

Dynamit Nobel Aktiengesellschaft: *See—*
Kops, Friedrich; Kaufmann, Helmut; and Schymetzko, Karl-Heinz, 4,101,620, Cl. 264-177.00R.
Kotzsch, Hans-Joachim; Muller, Gerhard; and Vahlensieck, Hans-Joachim, 4,101,397, Cl. 204-158.0HA.
Wienand, Michael; and Juch, Ernst, 4,101,689, Cl. 427-122.000.

E & E Specialties, Inc.: *See—*
White, Roger L.; and Dalton, Richard K., 4,101,256, Cl. 425-441.000.

E. R. Squibb & Sons, Inc.: *See—*
Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., 4,101,723, Cl. 544-360.000.

Earley, Donald M.: *See—*
Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.

Earth Pack, Inc.: *See—*
Grist, Warren W., 4,100,688, Cl. 37-117.500.

East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., to Stone & Webster Engineering Corporation. Impact energy absorbing pipe restraints. 4,101,117, Cl. 267-136.000.

East, George H., Jr.: *See—*
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.

Eastman Kodak Company: *See—*
Allen, Robert F., 4,101,325, Cl. 96-48.00R.
Barkey, Kenneth T., 4,101,326, Cl. 96-67.000.
Kayson, Walter, 4,101,211, Cl. 355-3.0DD.
Lambeth, David Noel, 4,101,947, Cl. 360-114.000.
Thomas, William A., Jr., 4,101,086, Cl. 242-18.0PW.

Ebihara, Heichachiro; and Yamada, Takashi, to Citizen Watch Company Limited. Shift register with reduced number of components. 4,101,790, Cl. 307-221.00C.

Eckert, Konrad; Knapp, Heinrich; and Stumpp, Gerhard, to Robert Bosch GmbH. Fuel injection system. 4,100,904, Cl. 123-139.0AW.

Eckhardt, Wolfgang: *See—*
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,101,672, Cl. 424-301.000.

Ederati, Richard M.; and Brown, William J., to Caterpillar Tractor Co. Steering column adjustment means. 4,101,147, Cl. 280-775.000.

Edwards, Aubrey John. Loudspeaker harness. 4,101,109, Cl. 248-317.000.

Edwards, Douglas Cameron; and Walker, John, to Polysar Limited. Mineral oil compositions with an isobutylene polymer containing bound 2,6-di-t-butyl phenol groups. 4,101,434, Cl. 252-52.00R.

Edwards, James H.: *See—*
Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., 4,101,423, Cl. 210-494.00M.

Edwards, Larry W., to CPC International Inc. Co-crystallization of dextrose and sucrose on cereal products. 4,101,680, Cl. 426-96.000.
Ekman, Adolphe. Device for indicating speed levels for motor vehicles. 4,101,870, Cl. 340-53.000.
Ekstrom, Olov: *See—*
Nilsson, Kenth; and Ekstrom, Olov, 4,100,798, Cl. 73-194.00E.
Electricite de France, Service National: *See—*
Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.
Electronics Corporation of America: *See—*
Newburgh, Ronald G., 4,101,452, Cl. 252-501.000.
Electrostatic Equipment Corporation: *See—*
Knudsen, Walter Ganter, 4,101,687, Cl. 427-25.000.
Elek, Sandor: *See—*
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.
Elekes, Istvan: *See—*
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.
Elitex Koncern textilniho strojirenstvi: *See—*
Resch, Josef; Matuska, Jan; and Trejtnar, Jindrich, 4,100,945, Cl. 139-291.00C.
Elliott Brothers (London) Limited: *See—*
Richmond, Michael; and Prichard, Richard Michael Hesketh, 4,101,933, Cl. 358-254.000.
Elliott, Roger Michael, to BSP International Foundations Limited. Drop hammers. 4,100,977, Cl. 173-134.000.
Elzinga, Johannes Mattheus; and Sondern, Albertus Derk, to U.S. Philips Corporation. X-ray system having a driving mechanism for an X-ray source and an X-ray detector. 4,101,774, Cl. 250-402.000.
Emery Industries, Inc.: *See—*
Lamont, James; and Braun, Robert J., 4,101,422, Cl. 210-84.000.
Emhart Industries, Inc.: *See—*
Solovieff, Paul G.; and Cyran, Robert E., 4,100,774, Cl. 70-380.000.
EMI Limited: *See—*
LeMay, Christopher Archibald Gordon; and Randall, Robert Paul, 4,101,773, Cl. 250-401.000.
Lill, Brian Herbert, 4,101,768, Cl. 250-360.000.
Emil Wohlhaupter u. Co.: *See—*
Wohlhaupter, Gerhard, 4,101,239, Cl. 408-182.000.
Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. N-aryl-N'-(2,3-dihalogeno-alkanoyl)-ureas. 4,101,575, Cl. 260-553.00E.
Endlich, Wilhelm: *See—*
Muller, Dieter; Endlich, Wilhelm; and Kugler, Siegfried, 4,100,954, Cl. 151-41.700.
Endress & Hauser GmbH & Co.: *See—*
Schurr, Peter, 4,101,865, Cl. 340-1.00L.
Engdahl, Paul D. Peak-recording accelerometer. 4,100,807, Cl. 73-492.000.
Engelhardt, Friedrich: *See—*
Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.
Engler, Maynard F.: *See—*
Kircher, Morton S.; and Engler, Maynard F., 4,101,410, Cl. 204-282.000.
English Clays Lovering Pochin & Co. Ltd.: *See—*
Webster, John David; Wilkinson, Anthony Austin; and Tucker, Frederick George, 4,101,623, Cl. 264-270.000.
English Electric Company Limited, The: *See—*
Lee, Alan Stuart, 4,101,148, Cl. 285-13.000.
Englund, Gosta Roland; and Wincent, Karl Tommy, to Svenska Dataregister Aktiebolag. Matrix print head. 4,101,017, Cl. 400-124.000.
Ensslin, Frieder Hans; and Hazen, Christopher Stevens, to Sybron Corporation. X-ray tube current stabilizing circuit. 4,101,775, Cl. 250-409.000.
Epp Corp.: *See—*
Solmon, Donald C.; and Lennon, Donald J. J., 4,101,909, Cl. 346-153.000.
Epstein, Max; and Nalamwar, Ashok L., to Northwestern University. Microacoustic shear bulk wave device. 4,101,852, Cl. 333-30.00R.
Erickson, John W., to Kobe, Inc. Vortex jet pump. 4,101,246, Cl. 417-171.000.
Erikson, Carl A.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.
Erismann, Hans; and Graf, Werner, to Graf & Cie. A.-G. Method and apparatus for producing a uniform textile fiber sliver. 4,100,649, Cl. 19-0.200.
Escher Wyss GmbH: *See—*
Barp, Bruno; and Holik, Herbert, 4,100,683, Cl. 34-124.000.
Estes, John H.: *See—*
Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., 4,101,560, Cl. 260-348.290.
Eston, Gary A.: *See—*
Sgarlato, Thomas E.; Eston, Gary A.; and Freeman, Thomas E., 4,100,686, Cl. 36-29.000.
Etat Francais: *See—*
Barbot, Jean Luc Y.; and Remon-Beauvais, Philippe M., 4,100,989, Cl. 180-127.000.
Etherington, Clifford, to United Kingdom Atomic Energy Authority. Extrusion. 4,101,253, Cl. 425-79.000.
Ethyl Corporation: *See—*
LoMaglio, Lewis C., 4,101,057, Cl. 222-207.000.
Ettipio, Marion Carol. Artificial breast and nightgown incorporating same. 4,100,621, Cl. 2-114.000.
Eurich, James T.: *See—*
Barie, Walter P., Jr.; and Eurich, James T., 4,101,516, Cl. 528-112.000.
Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., to Vought Corporation. Apparatus for evaluating a bond. 4,100,808, Cl. 73-588.000.
Evans, Norol T., to Hughes Aircraft Company. Constant false alarm rate doppler radar system. 4,101,889, Cl. 343-7.700.
Evett, Joel. Shift lever and integral handbrake apparatus. 4,100,820, Cl. 74-489.000.
Evin, Jean: *See—*
Duriez, Jean; and Evin, Jean, 4,101,013, Cl. 187-29.00R.
Exxon Research & Engineering Co.: *See—*
Floyd, Joseph C.; and Plank, Don A., 4,101,511, Cl. 260-45.85T.
Horowitz, Harold S.; and Longo, John M., 4,101,716, Cl. 429-13.000.
Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., 4,101,557, Cl. 260-327.00E.
Sartori, Guido; and Savage, David W., 4,101,633, Cl. 423-228.000.
Shaub, Harold, 4,101,427, Cl. 252-32.70E.
Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, 4,101,287, Cl. 23-288.00K.
F. L. Smidth & Co.: *See—*
Dano, Tage Halfdan, 4,101,337, Cl. 106-101.000.
Groiss, Karl, 4,101,268, Cl. 432-80.000.
Touborg, Jorn, 4,101,336, Cl. 106-106.000.
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, to General Tire & Rubber Company, The. Reaction products of hydrazides and certain unsaturated esters. 4,101,602, Cl. 260-839.000.
Facet Enterprises, Inc.: *See—*
Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., 4,101,950, Cl. 361-203.000.
Facon, Pierre Jean Alphonse, to Bertin & Cie. Swell abatement device. 4,100,747, Cl. 61-5.000.
Fahey, Darryl R., to Phillips Petroleum Company. Oxidative addition production of trans-halo-2(1,3-alkadienyl)bis(triethylphosphine) complexes of nickel(II), palladium(II), and platinum(II). 4,101,566, Cl. 260-439.00R.
Failliot, Olivier, to Compagnie des Etablissements de la Risle-Papeteries de Pont-Audemer. Composite material for use in covering walls, and a method of manufacturing same. 4,101,359, Cl. 156-179.000.
Faist, Walter, to Buhler-Miag GmbH. Housing for roll stands for grinding cereals or similar material. 4,101,083, Cl. 241-285.00R.
Fall, Herbert S.: *See—*
Adams, Steven M.; and Monroe, Joseph C., 4,101,178, Cl. 308-3.600.
Fantasia Confections, Inc.: *See—*
Lakatos, Charles, 4,100,830, Cl. 83-371.000.
Farfaglia, Silvio T.: *See—*
Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.
Farioli, Felice: *See—*
Ruoti, Vincenzo; and Farioli, Felice, 4,101,532, Cl. 528-311.000.
Farmer, Felta Carl, Jr., to RCA Corporation. Method and apparatus for measuring cathode emission slump. 4,101,823, Cl. 324-20.0CR.
Fasnacht, Floyd A., Jr., to United States of America, Energy. Vapor generator steam drum spray head. 4,100,888, Cl. 122-438.000.
Fateeva, Galina Vasilievna: *See—*
Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Arkadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.
Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, to Friedrich Uhde GmbH. Apparatus for the fermentative conversion of a nutrient mixture by means of microorganisms. 4,101,384, Cl. 195-142.000.
Feder, Ernest, to United Technologies Corporation. Acoustic liner. 4,100,993, Cl. 181-213.000.
Federal Paper Board Co., Inc.: *See—*
Ganz, Robert H., 4,100,715, Cl. 53-48.000.
Feichter, Lowell H.; and Anderson, Albert R., to Aluminum Company of America. Thermocouple device. 4,101,343, Cl. 136-230.000.
Fein, Michael E.; and Salisbury, Charles W., to Owens-Illinois, Inc. Gas laser. 4,101,846, Cl. 331-94.50D.
Feinberg, Robert S.; and Selick, David A. Tennis ball rejuvenator and maintainer. 4,101,029, Cl. 206-315.00B.
Feldmann, Rainer: *See—*
Burzin, Klaus; and Feldmann, Rainer, 4,101,524, Cl. 528-288.000.
Feleus, Christiaan C., to Boeing Company, The. Hydrofoil fixed strut steering control. 4,100,876, Cl. 114-274.000.
Fell, Peter Howard: *See—*
Kent, Alan Hugh; and Fell, Peter Howard, 4,101,197, Cl. 350-96.170.
Fenton, John D.: *See—*
Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., 4,100,808, Cl. 73-588.000.
Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, to AGFA-Gevaert A.G. Automatic color printing apparatus. 4,101,217, Cl. 355-38.000.
Ferguson, Harry J. S., to Clamp-All Corp. Clamp assembly. 4,101,151, Cl. 285-236.000.
Ferguson, Robert H. Pizza cutting board. 4,100,676, Cl. 30-292.000.

Fernaeus, Sven Evert; and Jonsson, Erik Anselm. Apparatus for manufacturing wave-shape building blocks. 4,101,255, Cl. 425-219.000.

Ferro, Arthur Charles, to Contour Chair-Lounge Co., Inc. Adjustable chair. 4,101,168, Cl. 297-329.000.

Ferrolegeringar Trollhatteverken AB: *See—*
Wallen, Jan, 4,101,316, Cl. 75-129.000.

Fetisov, Valentin Ivanovich: *See—*
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Fewkes, Harold L., to Little, Robert J.; and Morris, Ronald E., part interest to each. Water powered lift for speakers apparatus. 4,101,005, Cl. 187-17.000.

FIAT Societa per Azioni: *See—*
Gaggiano, Nicola, 4,101,138, Cl. 277-11.000.

Fiber Controls Corporation: *See—*
Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., 4,100,791, Cl. 73-37.700.

Fichet-Bauche: *See—*
Guiraud, Francois, 4,100,647, Cl. 16-139.000.
Guiraud, Francois, 4,100,776, Cl. 70-303.00A.

Fielding, John O.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.

Fieser, Arthur H.; and Finney, Donald C., to A. F. Industries, Inc. White rust inhibitor. 4,101,328, Cl. 428-624.000.

Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, to Institut Biokhimii I Fiziologii Mikroorganizmov. Biological ball mill. 4,101,079, Cl. 241-46.150.

Finney, Donald C.: *See—*
Fieser, Arthur H.; and Finney, Donald C., 4,101,328, Cl. 428-624.000.

Firestone Tire & Rubber Company, The: *See—*
Lohr, Delmar Frederick, Jr., 4,101,507, Cl. 260-45.80N.

Fischer, Donald A., to Kalt Manufacturing Company. Forging machine. 4,100,638, Cl. 10-15.000.

Fischer, Klaus; and Keul, Robert, to Saint-Gobain Industries. Neutral bronze glazings. 4,101,705, Cl. 428-220.000.

Fischer, Robert L., to Caterpillar Tractor Co. Tree shear-pivoted secondary blade. 4,100,951, Cl. 144-309.0AC.

Fischer, Robert L., to ACF Industries, Incorporated. Adjusting circuit for use in plasma arc cutting torch. 4,101,754, Cl. 219-121.00P.

Fisher, Leonard Joseph: *See—*
Pantland, Frederick William; and Pantland, Ernest Francis, 4,100,931, Cl. 137-77.000.

Fisli, Tibor, to Xerox Corporation. Process of making high speed multifaceted polygonal scanners. 4,101,365, Cl. 156-294.000.

Fisons Limited: *See—*
Hoare, Gordon Harold; and Lovegrove, Brian Walter, 4,101,070, Cl. 233-1.00R.
Needham, Brian John; and Smith, Michael Arthur, 4,101,581, Cl. 260-566.00B.

Fister, Aloysius J., to McGraw-Edison Company. Protector for electric circuits. 4,101,860, Cl. 337-159.000.

Fitzmaurice, Colin; and Webster, Norman William Fletcher, to Graesser Salicylates Limited. Method of preparing chromium alkanoates. 4,101,567, Cl. 260-438.50R.

Fleischer, Henry; and 105. Coupling device. 4,101,149, Cl. 285-55.000.

Fleissner, Hans, to Vepa Aktiengesellschaft. Process and apparatus for the continuous dyeing or printing of endless lengths of materials. 4,101,270, Cl. 8-17.000.

Flemming, Norbert A., to Polymer Corporation, The. Bar stock feed tube assembly. 4,100,827, Cl. 82-38.00A.

Fletchic, Donald K.: *See—*
Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., 4,101,619, Cl. 264-156.000.

Flexicore Co., Inc., The: *See—*
Shoe, Theodore W., 4,100,713, Cl. 52-648.000.

Flint, John R.; and Rabindran, K. George, to Bell & Howell Company. Control system for an image detector. 4,101,763, Cl. 250-214.00R.

Flint, John R., to Bell & Howell Company. Lamp control circuit. 4,101,808, Cl. 315-151.000.

Florence, Judit Katalin, to Singer Company, The. Sorter with overlap operation. 4,101,968, Cl. 364-900.000.

Floyd, Joseph C.; and Plank, Don A., to Exxon Research & Engineering Co. Novel bisphenol derivatives and uses thereof. 4,101,511, Cl. 260-45.85T.

FMC Corporation: *See—*
Haley, Harold A., 4,101,625, Cl. 264-287.000.
Lotto, Ronald L., 4,101,363, Cl. 156-250.000.
Tucker, Albert R., 4,100,752, Cl. 61-86.000.

Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, to Hoffmann-La Roche Inc. Aminophenyl esters of 5-carboxyalkyl barbituric acids. 4,101,549, Cl. 544-301.000.

Focke, Heinz; and Bretthauer, Hans-Jurgen, to Focke & Pfuhl. Means for the production and filling of a parallelepipedic packet. 4,100,718, Cl. 53-234.000.

Focke & Pfuhl: *See—*
Focke, Heinz; and Bretthauer, Hans-Jurgen, 4,100,718, Cl. 53-234.000.

Forde, Arnold. Rescue apparatus for submerged vessels. 4,100,871, Cl. 114-51.000.

Fordertechnik Streicher GmbH: *See—*
Plessing, Kurt, 4,101,113, Cl. 251-214.000.

Fornoff, Louis Leonard: *See—*
Ambrosini, Ronald Frank; Anderson, Richard Alan; Fornoff, Louis Leonard; and Manchanda, Krishan Dayal, 4,101,631, Cl. 423-210.000.

Foster, Harold M.: *See—*
Vacek, Lubomir; and Foster, Harold M., 4,101,558, Cl. 260-328.000.

Fottner, Gunther; and Waibel, Gottfried, to AGFA-Gevaert A.G. Cleaning device for an electrostatic copier. 4,101,215, Cl. 355-15.000.

Foucras, Jean: *See—*
Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.

Fox, Donald P.: *See—*
Baker, Richard G.; Vild, Joseph P.; Griesfelder, Charles; and Fox, Donald P., 4,101,832, Cl. 324-227.000.

Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., to Minnesota Mining and Manufacturing Company. Catalyst for condensation of hydrolyzable silanes and storage stable compositions thereof. 4,101,513, Cl. 526-193.000.

Fox, Ray D. Nozzle refacing tool. 4,101,240, Cl. 408-211.000.

Fox, Rita T.: *See—*
Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., 4,101,723, Cl. 544-360.000.

Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, to Procter & Gamble Company, The. Low phosphate content glassy phosphate detergent compositions having optimum detergency. 4,101,455, Cl. 252-531.000.

Frank Speno Railroad Ballast Cleaning Co., Inc.: *See—*
Panetti, Romolo, 4,100,795, Cl. 73-146.000.

Frankl & Kirchner GmbH. & Co. KG. Fabrik fur Elektromotoren und elektrische Apparate: *See—*
Reinecke, Harry; and Bachmann, Gerhard, 4,100,868, Cl. 112-277.000.

Franzl, Gertrude K. Adjustable safety seating device for bathtubs. 4,100,628, Cl. 4-185.00S.

Frass, Hans Werner: *See—*
Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, 4,101,323, Cl. 96-35.000.

Frass, Werner, to Hoechst Aktiengesellschaft. Light-sensitive copying compositions and photoinitiators contained therein. 4,101,327, Cl. 96-115.00P.

Fredon, Pierre Andre Gaston. Locking devices. 4,100,777, Cl. 70-363.000.

Freeman, Thomas E.: *See—*
Sgarlato, Thomas E.; Eston, Gary A.; and Freeman, Thomas E., 4,100,686, Cl. 36-29.000.

Frenier, Wayne W.; and Settineri, William J., to Dow Chemical Company, The. Sulfonium compounds as corrosion inhibitors in aqueous acidic cleaning solutions. 4,101,438, Cl. 252-151.000.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Cine camera. 4,101,209, Cl. 352-91.00C.

Freudenthal, Frank D., to Altec Industries, Inc. Side load protection arrangement for rotating equipment. 4,100,973, Cl. 173-44.000.

Frevel, Ludo K.; and Kressley, Leonard J., to Dow Chemical Company, The. Enhancement of promoted copper catalyst. 4,101,451, Cl. 252-465.000.

Frey, Thomas M., to Xerox Corporation. Controlled-width-synchronization of recorded pixels. 4,101,943, Cl. 360-84.000.

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Garland, Milton W., 4,100,757, Cl. 62-52.000.

Fricke, Jobst; and Reuter, Helmut, to CMB Colonia Management und Beratungsgesellschaft mbH & Co. KG. Volume control arrangement for an electro-acoustic system. 4,101,840, Cl. 330-127.000.

Friederich, Ernst, to Rohm GmbH. Method for injection molding of hollow shaped bodies from thermoplastic resins. 4,101,617, Cl. 264-93.000.

Friedman, Michael: *See—*
Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 4,100,719, Cl. 53-241.000.

Friedrich Deckel Aktiengesellschaft: *See—*
Geiger, Michael, 4,100,821, Cl. 74-606.00R.

Friedrich Uhde GmbH: *See—*
Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, 4,101,384, Cl. 195-142.000.
Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 4,101,645, Cl. 423-648.00A.

Fries, Christopher. Portable greenhouse. 4,100,698, Cl. 47-29.000.

Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, to Paul Gillet GmbH. Apparatus for purification of waste from combustion engines. 4,101,280, Cl. 23-288.0FC.

Fritz Eichenauer, Firma: *See—*
Roller, Hanno, 4,101,760, Cl. 219-544.000.

Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, to International Business Machines Corporation. Arrangement for absorbing vibrations. 4,101,008, Cl. 188-1.00B.

Frost, Francis Edmund; and Mack, Robert. Pneumatic automatic screwfeeder. 4,101,054, Cl. 221-278.000.

Fuji Photo Film Co., Ltd.: *See—*
Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, 4,101,311, Cl. 75-0.500.
Miyamoto, Akio; and Matsukawa, Hiroharu, 4,101,690, Cl. 427-150.000.

Oishi, Kengo; and Suzuki, Osamu, 4,101,096, Cl. 242-199.000.
Tadokoro, Eiichi; and Kitamoto, Tatsuji, 4,101,948, Cl. 360-137.000.
Fujiike, Hiroshi: *See—*
Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.
Fujikura Cable Works, Ltd., The: *See—*
Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, to Daido Tokushuko Kabushiki Kaisha. Ferrite-austenite stainless steel castings having an improved erosion-corrosion resistance. 4,101,347, Cl. 148-38.000.
Fujikura, Yoshiaki: *See—*
Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.
Fujimi Kenmazai Kogyo Co., Ltd.: *See—*
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.
Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, to Kumiai Chemical Industry Co., Ltd. Germicidal and acaricidal compositions. 4,101,670, Cl. 424-300.000.
Fujimoto, Yasuo: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
Fujimura, Toshio: *See—*
Shimizu, Keizo; Maruyama, Takeshi; and Fujimura, Toshio, 4,101,878, Cl. 340-310.00R.
Fujishiro, Takeshi: *See—*
Kita, Toru; and Fujishiro, Takeshi, 4,101,403, Cl. 204-195.00S.
Fujishiro, Yuji; and Ohta, Hideo, to Japan Society for Promotion of Machine Industry. Device for mounting resin plate onto plate cylinder. 4,100,854, Cl. 101-415.100.
Fukuda, Shigeyoshi: *See—*
Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, 4,101,312, Cl. 75-52.000.
Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, to Nippon Mektron Kabushiki Kaisha. Method of manufacturing laminated buses. 4,101,361, Cl. 156-250.000.
Fukui, Akio: *See—*
Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
Fukukita, Hiroshi: *See—*
Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, 4,101,795, Cl. 310-336.000.
Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, to Matsushita Electric Industrial Company. Ultrasonic probe. 4,101,795, Cl. 310-336.000.
Fukunaga, Motoaki, to Glory Kogyo Kabushiki Kaisha. Coin jamming detecting device. 4,100,925, Cl. 133-3.00F.
Fukuoka, Kenji, to Olympus Optical Co., Ltd. Coding system. 4,101,934, Cl. 358-261.000.
Fuller, Clyde R.: *See—*
Shah, Pradeep L.; and Fuller, Clyde R., 4,101,351, Cl. 148-188.000.
Furuya, Seiji; and Smartt, Roger H. Individual, disposable holders for cigarettes and dispensers thereof. 4,101,024, Cl. 206-102.000.
G. C. Broach Company, The: *See—*
Broach, George C.; and Thurman, Donald W., 4,101,265, Cl. 432-29.000.
G. T. Schjeldahl Company: *See—*
Adams, Richard C., 4,101,369, Cl. 156-510.000.
Gablin, Kenneth A.; and Hansen, Larry J., to Nuclear Engineering Co., Inc. Safe transporation of hazardous materials. 4,100,860, Cl. 109-83.000.
Gabor, Charles K., to Raymond Lee Organization, Inc., The. Paint roller and brush combination. 4,100,642, Cl. 15-114.000.
GAF Corporation: *See—*
Khattab, Ghazi; and Naviello, Gerard P., 4,101,502, Cl. 260-40.00R.
Gaggiano, Nicola, to FIAT Societa per Azioni. Gasket for internal combustion engines, incorporating locating pins. 4,101,138, Cl. 277-11.000.
Gair, Albert W.: *See—*
Herbenar, Edward J.; and Gair, Albert W., 4,101,227, Cl. 403-27.000.
Gaisser, Max: *See—*
Ott, Theodor; and Gaisser, Max, 4,100,636, Cl. 7-158.000.
Gallagher, John Bernard: *See—*
Kindraka, James Alexander; and Gallagher, John Bernard, 4,101,539, Cl. 260-112.50R.
Gallistel, Albert F.; and Lindenfelser, Jerome W., to Photo-Control Corporation. Four-up polaroid camera. 4,101,913, Cl. 354-122.000.
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich. Installation for explosion machining of articles. 4,100,783, Cl. 72-56.000.
Gantke, Franz: *See—*
Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
Ganz, Robert H., to Federal Paper Board Co., Inc. Bottle packaging machine. 4,100,715, Cl. 53-48.000.
Gardipee, Walter E. Fisherman's knot tying jig. 4,101,152, Cl. 289-17.000.
Gardner, Beth Ann: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,101,663, Cl. 424-267.000.
Gardner-Denver Company: *See—*
Wilkinson, Brendan Michael; and Belfiore, Erasmo, 4,100,982, Cl. 175-206.000.
Garfinkel, Marvin: *See—*
Brown, Dale M.; and Garfinkel, Marvin, 4,101,924, Cl. 357-30.000.
Garland, Milton W., to Frick Company. Closed circuit ammonia system for liquid heating from water. 4,100,757, Cl. 62-52.000.
Garrison, Donald W.: *See—*
Reese, Robert O.; and Garrison, Donald W., 4,101,963, Cl. 364-705.000.
Garrison, Judd F.: *See—*
Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., 4,101,059, Cl. 223-85.000.
Garwin, Leo. Isotopically enriched helium-4. 4,101,375, Cl. 176-37.000.
Gas- und Wassermesserfabrik AG: *See—*
Gass, Heinz, 4,100,803, Cl. 73-230.000.
Gass, Heinz, to Gas- und Wassermesserfabrik AG. Apparatus for measuring the volume of a flowing fluid, particularly a gas in pipes. 4,100,803, Cl. 73-230.000.
Gassman, Paul G., to Ohio State University Research Foundation, The. Alpha-methylthio-alpha-(2-aminophenyl) acetaldehyde diloweralkyl acetals. 4,101,583, Cl. 260-575.000.
Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., to Caterpillar Tractor Co. Hydraulic conduit having pivoting and telescoping capability. 4,101,251, Cl. 417-313.000.
Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., to Akzona Incorporated. Test apparatus. 4,100,796, Cl. 73-160.000.
GB Fermentation Industries, Inc.: *See—*
Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, to Champion Products Inc. System for controlling the moisture content of flock in a flocking machine. 4,101,685, Cl. 427-8.000.
Gebr. Marklin & Cie. GmbH: *See—*
Bos, Horst, 4,101,205, Cl. 350-289.000.
Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, to Hoechst Aktiengesellschaft. Production of methyldichlorophosphane. 4,101,573, Cl. 260-543.00P.
Geiger, Michael, to Friedrich Deckel Aktiengesellschaft. Multistage gear controlling mechanism. 4,100,821, Cl. 74-606.00R.
Geisler, Phillip H.: *See—*
Wade, Jerry D.; and Geisler, Phillip H., 4,100,886, Cl. 119-98.000.
Geiszler, Adolph Oscar: *See—*
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,101,677, Cl. 424-330.000.
Geldner, Joachim: *See—*
Rones, Josef; and Geldner, Joachim, 4,101,437, Cl. 252-149.000.
General Cable Corporation: *See—*
Schmidt, Gertraud A.; and Bopp, Louis A., 4,101,512, Cl. 260-45.95C.
General Communications Co., Inc.: *See—*
Taylor, Frank D.; and Novotny, Ronald J., 4,101,835, Cl. 325-55.000.
General Electric Company: *See—*
Alley, Robert P., 4,101,806, Cl. 315-86.000.
Anderson, Robert M.; and Hanson, James M., 4,101,953, Cl. 362-11.000.
Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.
Balchunas, Charles A., 4,101,729, Cl. 174-65.00R.
Bean, Charles P.; and Uzgiris, Egidijus E., 4,101,220, Cl. 356-105.000.
Brown, Dale M.; and Garfinkel, Marvin, 4,101,924, Cl. 357-30.000.
Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, 4,100,732, Cl. 60-39.360.
Cooper, Glenn Dale; and Katchman, Arthur, 4,101,503, Cl. 260-42.180.
Cooper, Glenn Dale; and Katchman, Arthur, 4,101,504, Cl. 260-42.180.
Cooper, Glenn Dale; and Katchman, Arthur, 4,101,505, Cl. 260-42.180.
Culbertson, Richard; and Klucznik, Paul J., 4,101,089, Cl. 242-85.100.
Hallgren, John E., 4,101,519, Cl. 528-197.000.
Hirsch, Harold H.; and Rairden, John R., III, 4,101,713, Cl. 428-554.000.
Kimura, Shiro G., 4,101,294, Cl. 48-77.000.
Lupinski, John H.; and Gorowitz, Bernard, 4,100,883, Cl. 118-630.000.
Morais, Don, 4,101,809, Cl. 315-156.000.
Peterson, Marvin A., 4,101,487, Cl. 260-29.20N.
Rairden, John R., III, 4,101,714, Cl. 428-639.000.
Rairden, John R., III, 4,101,715, Cl. 428-652.000.
Sensabaugh, Paul F., 4,100,653, Cl. 24-3.00J.
Stutt, Charles A.; and Rankin, Richard W., 4,101,834, Cl. 325-42.000.
Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,101,693, Cl. 427-386.000.
Ziemba, Richard Thomas, 4,100,856, Cl. 102-206.000.

General-Electro Mechanical Corp.: *See—*
Vargo, Joseph, Jr.; and Davern, John W., 4,101,064, Cl. 227-53.000.
General Foods Limited: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.
General Motors Corporation: *See—*
Thune, Robert H., 4,100,828, Cl. 83-1.000.
General Tire & Rubber Company, The: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,101,602, Cl. 260-839.000.
Gentse, Mstislav Vladimirovich: *See—*
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
Geophysical Systems Corporation: *See—*
Martin, Lincoln A., 4,101,867, Cl. 340-15.5TC.
George, Richard W.: *See—*
Difiglio, Joseph J.; and George, Richard W., 4,101,284, Cl. 23-259.000.
Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, to DSO "Cherna Metalurgia". Contact clamp for graphite electrodes. 4,101,186, Cl. 339-5.00S.
Geppert, Barbara; and Huth, Kurt, to Bellaplast GmbH. Laminated material of thermoplastic synthetic material, process of making and container closed therewith. 4,101,047, Cl. 220-258.000.
Gergen, William P.; and Davison, Sol, to Shell Oil Company. Thermoplasticpolyester/block copolymer blend. 4,101,605, Cl. 260-873.000.
Germani, Cesare, to Omita S.p.A. Method and apparatus for transferring the weft. 4,100,944, Cl. 139-439.000.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Schmieder, Helmut; Goldacker, Hubert; and Roos, Werner, 4,101,408, Cl. 204-272.000.
Gessinger, Gernot: *See—*
Bomford, Michael J.; and Gessinger, Gernot, 4,101,712, Cl. 428-547.000.
Gettings, Jacob D.: *See—*
Mowen, Robert P.; and Gettings, Jacob D., 4,100,862, Cl. 111-52.000.
GF Business Equipment, Inc.: *See—*
Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., 4,101,166, Cl. 297-304.000.
Gibson, Robert R., to Van Horne, William J. Caulking spout. 4,101,077, Cl. 239-598.000.
Gies, Rolf: *See—*
Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.
Gikow, Emanuel, deceased (by Gikow, Ida M., executrix); and Tilton, Richard S., to United States of America, Army. Tunable helical resonator. 4,101,854, Cl. 333-82.00B.
Gikow, Ida M., executrix: *See—*
Gikow, Emanuel, deceased; and Tilton, Richard S., 4,101,854, Cl. 333-82.00B.
Gildemeister AG: *See—*
Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, 4,100,671, Cl. 29-568.000.
Gillet, Roger: *See—*
Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.
Gillette Company, The: *See—*
Van Dyck, Kenneth Arthur; Wyatt, James Bartlett; Stephenson, Charles Francis; and Miller, Scott William, 4,101,757, Cl. 219-225.000.
Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, to Texaco Development Corp. 2,2-Dialkylepoxides. 4,101,515, Cl. 252-182.000.
Glancy, John, to Indiana University Foundation. Dynamic orthotic knee extension assist device. 4,100,918, Cl. 128-80.00F.
Glimmer Security Systems Inc.: *See—*
Lurkis, Alexander; and Hill, John I., 4,101,876, Cl. 340-555.000.
Globin, Nikolai Kirillovich: *See—*
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Glory Kogyo Kabushiki Kaisha: *See—*
Fukunaga, Motoaki, 4,100,925, Cl. 133-3.00F.
Gobel, Armin: *See—*
Patzschke, Hans-Peter; and Gobel, Armin, 4,101,495, Cl. 260-29.7NR.
Goetsch, Henry E.; Cook, James A.; and Armstrong, Lee R., to United Technologies Corporation. Air/fuel regulator diagnostics for internal combustion engine. 4,100,793, Cl. 73-118.000.
Goetzewerke Friedrich Goetze AG: *See—*
Beyer, Horst; and Buran, Ulrich, 4,101,319, Cl. 75-252.000.
Goffe, William L.: *See—*
Levy, Mortimer; and Goffe, William L., 4,101,321, Cl. 96-1.50R.
Goldacker, Hubert: *See—*
Schmieder, Helmut; Goldacker, Hubert; and Roos, Werner, 4,101,408, Cl. 204-272.000.
Golden, William R.: *See—*
Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.
Golden Wonder Limited: *See—*
Masson, John Richard; and Dooley, Joseph, 4,101,684, Cl. 426-625.000.
Goldesberry, John M.: *See—*
Morrison, Gary Eugene, 4,101,897, Cl. 343-715.000.
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich. Device for epitaxial growing of semiconductor periodic structures from gas phase. 4,100,879, Cl. 118-49.100.
Goldstein, Norman A.: *See—*
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
Golladay, Steven D.: *See—*
Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., 4,101,813, Cl. 315-370.000.
Gomperts, Robert J.; and Driesen, Gerard M. V., to GTE International, Inc. Differential current detector. 4,101,829, Cl. 324-126.000.
Good, Wayne W., to Harter Corporation. Frame construction for a divider wall. 4,100,709, Cl. 52-239.000.
Goralski, Christian T.: *See—*
Mixan, Craig E.; and Goralski, Christian T., 4,101,546, Cl. 544-408.000.
Gorchev, Dimiter; and McGraw, John D., to Mitco Corporation. Induction ventilation system. 4,100,964, Cl. 165-40.000.
Gordon, Michael E., to Polaroid Corporation. I.D. cards. 4,101,701, Cl. 428-189.000.
Gorgerat, Jean Pierre, to Rueger S.A. Bimetallic temperature measuring device. 4,100,804, Cl. 73-363.900.
Gorowitz, Bernard: *See—*
Lupinski, John H.; and Gorowitz, Bernard, 4,100,883, Cl. 118-630.000.
Goryo, Tadashi: *See—*
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., to Acme-Cleveland Corporation. Foundry molding machine. 4,100,961, Cl. 164-180.000.
Gottschalk, Robert E.; and Mayer, Albert L., to Panavision, Incorporated. Illuminated ground glass for camera. 4,101,916, Cl. 354-219.000.
Gould Inc.: *See—*
Netzel, Philip C., 4,101,730, Cl. 174-75.00R.
Wilson, George A., 4,101,744, Cl. 200-50.0AA.
Gould, James S.; and Gould, Samuel, to Indicator Controls Corporation. Mounting bracket assembly for pedestrian traffic signal. 4,101,191, Cl. 339-125.00R.
Gould, Samuel: *See—*
Gould, James S.; and Gould, Samuel, 4,101,191, Cl. 339-125.00R.
Gouveia, Michael P.: *See—*
Mattimoe, George E.; and Gouveia, Michael P., 4,101,056, Cl. 222-26.000.
Gow Enterprises Limited: *See—*
Westerlund, G. Oscar, 4,101,406, Cl. 204-239.000.
Goyard, Pierre Jean-Marie, to International Standard Electric Corporation. Radar reconnaissance system for track vehicle recognition. 4,101,890, Cl. 343-8.000.
Graesser Salicylates Limited: *See—*
Fitzmaurice, Colin; and Webster, Norman William Fletcher, 4,101,567, Cl. 260-438.50R.
Graf & Cie. A.-G.: *See—*
Erismann, Hans; and Graf, Werner, 4,100,649, Cl. 19-0.200.
Graf, Werner: *See—*
Erismann, Hans; and Graf, Werner, 4,100,649, Cl. 19-0.200.
Grapes, Eugene F.: *See—*
Patterson, William W., III; and Grapes, Eugene F., 4,100,875, Cl. 114-251.000.
Gray, Tommy L.; and Crowe, Sam R., to Span Instruments. Dry pressure gauge with dampened needle movement. 4,100,812, Cl. 73-732.000.
Greif Bros. Corporation: *See—*
Santoni, Cesar, 4,101,156, Cl. 292-256.690.
Greig, John H., to MSI Electronics Inc. Mercury probe. 4,101,830, Cl. 324-158.00F.
Gretag Aktiengesellschaft: *See—*
Grossmann, Walter, 4,101,216, Cl. 355-35.000.
Gretler, Heinrich, to Bauer Kaba AG Sicherheits-Schliessyteme. Key with transverse slots and method of making same. 4,100,778, Cl. 70-406.000.
Grieger, Gerhard; and Bohrdt, Joaquin, to Siemens Aktiengesellschaft. Apparatus for controlling the drive for hydraulically actuated high-voltage power circuit breakers. 4,101,746, Cl. 200-82.00B.

Grieser, Fred J., Jr.: *See—*
Grieser, Fred J., Sr.; and Grieser, Fred J., Jr., 4,100,637, Cl. 7-158.000.
Grieser, Fred J., Sr.; and Grieser, Fred J., Jr. Combination tool. 4,100,637, Cl. 7-158.000.
Griesfelder, Charles: *See—*
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Griffin, Warren H.: *See—*
Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., 4,101,467, Cl. 521-79.000.
Griffiths, Bernard L., to Atlas Foundry & Mfg. Co. Water cooling jacket for induction furnace water bushing. 4,101,726, Cl. 13-29.000.
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate. Apparatus for conserving energy in electrical appliances. 4,101,886, Cl. 165-14.000.
Grissinger, Glenn R., to Teledyne Industries, Inc. High speed bun production system. 4,100,848, Cl. 99-353.000.
Grist, Warren W., to Earth Pack, Inc. Earth working apparatus. 4,100,688, Cl. 37-117.500.
Groiss, Karl, to F. L. Smidth & Co. Rotary kiln with planetary cooler. 4,101,268, Cl. 432-80.000.
Groll, Manfred; and Bien, Hans-Samuel, deceased (by Bien, Else, administrator), to Bayer Aktiengesellschaft. Quinophthalone dyestuffs. 4,101,551, Cl. 260-283.0SA.
Grootjans, Jacques F. J.: *See—*
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,101,599, Cl. 260-683.900.
Gross, Jerome A. Expanding crimp tool for valved dispensers and the like. 4,100,869, Cl. 113-18.00R.
Grossmann, Walter, to Gretag Aktiengesellschaft. Method and apparatus for print exposure control. 4,101,216, Cl. 355-35.000.
Grotberg, Robert B. Vertical axle paddle motor. 4,101,244, Cl. 416-41.000.
Gruber, David P.: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,101,602, Cl. 260-839.000.
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, to Mannesmann Aktiengesellschaft. Treating a stream of molten metal. 4,100,959, Cl. 164-56.000.
GTE International, Inc.: *See—*
Gomperts, Robert J.; and Driesen, Gerard M. V., 4,101,829, Cl. 324-126.000.
GTE Sylvania Incorporated: *See—*
Buljan, Sergei-Tomislav, 4,101,616, Cl. 264-65.000.
Collins, Floyd K., 4,101,801, Cl. 313-417.000.
Kirby, Thomas J., 4,101,821, Cl. 323-119.000.
Shaffer, John W.; Mecone, David W.; and Colville, William T., 4,101,259, Cl. 431-93.000.
Guiraud, Francois, to Fichet-Bauche. Pivot device for doors of strong boxes, safes or the like. 4,100,647, Cl. 16-139.000.
Guiraud, Francois, to Fichet-Bauche. Combination lock for safes and the like. 4,100,776, Cl. 70-303.00A.
Guise, Geoffrey Bruce; and Jones, Francis William, to Commonwealth Scientific and Industrial Research Organization. Process for the treatment of wool with polyorganosiloxanes. 4,101,272, Cl. 8-127.600.
Gulf Research & Development Company: *See—*
Barie, Walter P., Jr.; and Eurich, James T., 4,101,516, Cl. 528-112.000.
Mitchell, Bruce Richard; and Swift, Harold Eugene, 4,101,417, Cl. 208-120.000.
Schulz, J. Gustav; and Sabourin, Edward T., 4,101,469, Cl. 521-83.000.
Gulko, Arnold G.; and Steinberg, Jacob H. Solar cells. 4,101,923, Cl. 357-30.000.
Gurevich, Grigory Aronovich: *See—*
Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, 4,101,079, Cl. 241-46.150.
Gurwara, Sweet K.: *See—*
Rich, Daniel H.; and Gurwara, Sweet K., 4,101,721, Cl. 526-19.000.
Gutbier, Ernst A.: *See—*
Corsaro, Vincent A.; and Gutbier, Ernst A., 4,101,066, Cl. 228-180.00R.
Gutridge, Jack E.; and Marulic, Walter J., to Pullman Incorporated. Passageway between adjacent railway passenger car compartments. 4,100,857, Cl. 105-323.000.
Gyarmathy, Georg; and Pfenninger, Hans, to BBC Brown Boveri & Company Limited. Thermal power plant with compressed air storage. 4,100,745, Cl. 60-652.000.
H & F Faller Sales Corp. Ltd.: *See—*
Obidniak, Andy, 4,101,032, Cl. 206-457.000.
H. J. Langen & Sons Ltd.: *See—*
Langen, Marinus J. M., 4,101,020, Cl. 198-478.000.
Haag, Franz; and Bongartz, Paul, to MOTAN Gesellschaft mit beschrankter Haftung. Apparatus for mixing granulated and/or pulverous materials. 4,101,116, Cl. 366-142.000.
Haapala, Ray. Tier support system for fancy cakes. 4,101,232, Cl. 403-261.000.
Haarer, Dietrich: *See—*
Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, 4,101,976, Cl. 365-119.000.
Haferl, Peter Eduard, to RCA Corporation. Side pincushion distortion correction circuit. 4,101,814, Cl. 315-371.000.
Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., to Facet Enterprises, Inc. Portable fluid transfer pump. 4,101,950, Cl. 361-203.000.
Haid, Erich: *See—*
Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.
Hajduk, Marian Stanislaw, to Tendy Electronics Co. Single bit logic microprocessor. 4,101,967, Cl. 364-900.000.
Hakata, Masayuki, to Casio Computer Co., Ltd. Electronic calculator for determining biorhythm data. 4,101,962, Cl. 364-413.000.
Hale, William J.; Horst, William R.; and Walker, Donald A., to NCR Corporation. Method for writing and viewing magnetic human readable characters and viewing means therefor. 4,101,905, Cl. 346-74.100.
Haley, Harold A., to FMC Corporation. Method for making corrugated molecularly oriented plastic strapping. 4,101,625, Cl. 264-287.000.
Halker, Bruce B.: *See—*
Rhees, Raymond C.; and Halker, Bruce B., 4,101,390, Cl. 204-57.000.
Hallcher, Richard C., to Monsanto Company. Electrolytic oxidative methyl-methyl coupling of cresol salts. 4,101,391, Cl. 204-59.00R.
Hallcher, Richard C.; and Baizer, Manuel M., to Monsanto Company. Process for electrolytic oxidative methyl-methyl coupling of cresol salts. 4,101,392, Cl. 204-59.00R.
Hallgren, John E., to General Electric Company. Polycarbonate equilibration method. 4,101,519, Cl. 528-197.000.
Hamel, Edmund, to OFA AG. Method of making a core yarn. 4,100,727, Cl. 57-160.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing apparatus. 4,100,852, Cl. 101-295.000.
Hammer, Henry H., to Twin Oaks Community. Hammock chair. 4,101,165, Cl. 297-273.000.
Hamprecht, Gerhard: *See—*
Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,101,571, Cl. 260-543.00R.
Hanai, Ichiro, to Sony Corporation. Apparatus for reproducing high fidelity magnetic tapes from a master tape. 4,101,938, Cl. 360-16.000.
Hans Giesbert KG: *See—*
Sauer, Walter, 4,101,021, Cl. 198-668.000.
Hansen, Larry J.: *See—*
Gablin, Kenneth A.; and Hansen, Larry J., 4,100,860, Cl. 109-83.000.
Hansen, Roger M., to Stratabolt Corporation. Mine roof or rock bolt expansion anchor of the bail type. 4,100,748, Cl. 61-45.00B.
Hansenwinkle, Earl Dean; Kuanoni, Clement; and Wislocker, Frank, to Weyerhaeuser Company. Width adjusting thickness setting clamping system. 4,101,372, Cl. 156-580.000.
Hanson, James M.: *See—*
Anderson, Robert M.; and Hanson, James M., 4,101,953, Cl. 362-11.000.
Hanson, Marlin Marshall: *See—*
Lins, Stanley James; Lund, Roger Edward; and Hanson, Marlin Marshall, 4,101,972, Cl. 365-29.000.
Harao, Norio: *See—*
Minami, Hiroshi; Harao, Norio; and Tsuneoka, Takuji, 4,101,766, Cl. 250-320.000.
Hardy, Craig A.: *See—*
Kelley, Larry P.; and Hardy, Craig A., 4,101,925, Cl. 357-68.000.
Hargis, Robert L., to Aluminum Company of America. Method of cleaning filter bags in a system for effluent gas recycling and recovery from electrolytic cells for production of aluminum from aluminum chloride. 4,101,393, Cl. 204-67.000.
Harnish, James Ranck, to Borg-Warner Corporation. Check valve for heat pump systems. 4,100,935, Cl. 137-533.110.
Harp, James L., Jr., to United States of America, Army. Turbocompound engine with turbocharger control. 4,100,742, Cl. 60-602.000.
Harre, Kurt Johan Stausgaard; and Thufvesson, Kenth Anker, to ABU Aktiebolag. Braking device in a non-rotary type fishing reel. 4,101,087, Cl. 242-84.20A.
Harris Corporation: *See—*
Wiggin, Joseph F., 4,101,932, Cl. 358-223.000.
Harris, Frederick John, to Olin Corporation. Controlling hardness of anchor bolt expansion sleeves. 4,100,834, Cl. 85-77.000.
Harrison, George W., to Team, Inc. Across the line plugging apparatus and method. 4,100,929, Cl. 137-15.000.
Hart, John Peter: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,101,685, Cl. 427-8.000.
Harter Corporation: *See—*
Good, Wayne W., 4,100,709, Cl. 52-239.000.
Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, to Allen & Hanburys Limited. Phenethanolamine ethers. 4,101,579, Cl. 260-559.00R.
Hartley, Derald L.: *See—*
Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., 4,101,251, Cl. 417-313.000.
Hartmann, Charles Harold, to Varian Associates, Inc. Ionization detector utilizing tritiated scandium with an acceptable tritium emanation rate at high temperature. 4,101,278, Cl. 23-232.00C.
Harvey, Gerald J., to William Printz Company, Inc. Electronic orsat for gas analysis. 4,100,790, Cl. 73-23.100.
Hasbro Development Corp.: *See—*
Smith, Jay, III; and Conroy, Richard F. M., 4,101,134, Cl. 274-23.00R.
Smith, Jay, III; and Conroy, Richard F. M., 4,101,135, Cl. 274-39.00A.
Hasegawa, Masakatsu; and Hokkoku, Syusaburo, to Meito Sangyo

Kabushiki Kaisha. Magnetic iron oxide-dextran complex and process for its production. 4,101,435, Cl. 252-62.530.

Haskell, Theodore H.: *See—*
Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, 4,101,661, Cl. 424-266.000.

Hasker, Jan: *See—*
van Esdonk, Johannes; Hasker, Jan; and Vervest, Johannes Cornelis Gerardus, 4,101,185, Cl. 316-19.000.

Hattori, Mitsuhiro: *See—*
Nakayama, Shozo; Kurahashi, Masayuki; and Hattori, Mitsuhiro, 4,101,249, Cl. 417-269.000.

Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, to Nippon Soken, Inc. Electronic ignition timing control system for an internal combustion engine. 4,100,895, Cl. 123-117.00R.

Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., to E. R. Squibb & Sons, Inc. Substituted piperazinopropanols. 4,101,723, Cl. 544-360.000.

Haufe, Claus-Dieter: *See—*
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.

Haumann, Dewey H., Jr.: *See—*
Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., 4,101,267, Cl. 432-60.000.

Hauni-Werke Korber & Co. KG: *See—*
Korber, Kurt A., 4,100,845, Cl. 93-77.0FT.

Haus, Rein, to Wheelock Signals, Inc. Audiovisual signaling device. 4,101,880, Cl. 340-326.000.

Hauser, James C.: *See—*
Mitchell, Michael W.; and Hauser, James C., 4,100,635, Cl. 5-368.000.

Hauser, Raimund: *See—*
Freudenschuss, Otto, 4,101,209, Cl. 352-91.00C.

Havens, Carl B., to Dow Chemical Company, The. Blown film process. 4,101,614, Cl. 264-40.600.

Hayashi, Hideaki: *See—*
Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, 4,101,133, Cl. 274-23.00R.

Hayashi, Nobuyuki: *See—*
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Hayashi, Yoshimasa: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; and Takagi, Yasuo, 4,100,736, Cl. 60-278.000.

Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,101,593, Cl. 260-666.00A.

Hazen, Christopher Stevens: *See—*
Ensslin, Frieder Hans; and Hazen, Christopher Stevens, 4,101,775, Cl. 250-409.000.

Heat Exchangers Africa Limited: *See—*
Thomas, Hector, 4,100,784, Cl. 72-98.000.

Heath, George. Adjustable tennis racket. 4,101,125, Cl. 273-75.000.

Heeres, Jan, to Janssen Pharmaceutica N.V. 1-(2-Ar-4-aryloxymethyl-1,3-dioxolan-2-ylmethyl)-imidazoles. 4,101,664, Cl. 424-273.00R.

Heeres, Jan, to Janssen Pharmaceutica N.V. 1-(2-Ar-4-aryloxymethyl-1,3-dioxolan-2-ylmethyl)imidazoles. 4,101,665, Cl. 424-273.00R.

Heeres, Jan, to Janssen Pharmaceutica N.V. 1-(2-Ar-4-R-1,3-dioxolan-2-ylmethyl)imidazoles. 4,101,666, Cl. 424-273.00R.

Hegewaldt, Fritz: *See—*
Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, 4,101,724, Cl. 13-1.000.

Hehl, Walter; and Matthaei, Horst, to International Business Machines Corporation. Non reactive positioning device. 4,101,009, Cl. 188-1.00B.

Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Jahn, Hans-Georg, 4,100,851, Cl. 101-248.000.
Jeschke, Willi; and Wirz, Arno, 4,101,122, Cl. 271-277.000.

Heim, Richard C., to Westinghouse Electric Corp. Apparatus for ultrasonic cleaning with liquid solvent in a blanket of vapor. 4,100,926, Cl. 134-64.00R.

Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, to Brown Boveri Corporation. Furnace conversion method and apparatus. 4,101,724, Cl. 13-1.000.

Heinzle, Elmar: *See—*
Lafferty, Robert M.; and Heinzle, Elmar, 4,101,533, Cl. 528-491.000.

Heitzman, Charles J. Pulsating fluid spray device. 4,101,075, Cl. 239-101.000.

Heldt, Earl R., to Hewlett-Packard Company. Fiber optic connector with split ferrule assembly. 4,101,198, Cl. 350-96.200.

Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, to ITT Industries, Incorporated. Anticollision car radar. 4,101,888, Cl. 343-7.0VM.

Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, to American Hoechst Corporation. Benzoylpiperidylalkylindoles. 4,101,663, Cl. 424-267.000.

Hempenius, Klaas; Van Mourik, Jan Cornelis; and Stevens, Petrus Franciscus, to U.S. Philips Corporation. Keyboard. 4,101,883, Cl. 340-365.00R.

Henderson, Henning M., to Alert-O-Drive (Pty) Ltd. Vehicle warning devices. 4,101,869, Cl. 340-52.00R.

Henninger, William H. High torque rotary electromagnetic actuator. 4,101,858, Cl. 335-272.000.

Henry, Rodney D., to Rockwell International Corporation. Homogeneous multilayer dielectric mirror and method of making same. 4,101,707, Cl. 428-409.000.

Henze, Richard H.: *See—*
Paquette, Francis A.; and Henze, Richard H., 4,101,044, Cl. 215-228.000.

Herbenar, Edward J.; and Gair, Albert W., to TRW Inc. Pivot joint. 4,101,227, Cl. 403-27.000.

Hercules Incorporated: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,101,358, Cl. 156-167.000.

Herdeg, Donald Franklin: *See—*
Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, 4,100,864, Cl. 112-121.110.

Hergeth KG Muschinenfabrik und Apparatebann: *See—*
Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, 4,100,650, Cl. 19-105.000.

Hernandez, John Michael, to Colgate-Palmolive Company. Disposable diaper. 4,100,922, Cl. 128-284.000.

Herr, Roy Wilbur: *See—*
Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, 4,101,387, Cl. 204-43.00T.

Herrmann, Lothar; and Schur, Gotthold, to Botek Praezisions-Bohrtechnik Schur & Co., Firma. Boring device. 4,100,983, Cl. 175-383.000.

Hertler, Wolfram: *See—*
Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, 4,101,888, Cl. 343-7.0VM.

Herzig, Joachim, to Bayer Aktiengesellschaft. Polyorganosiloxanes containing homogeneously distributed fillers. 4,101,499, Cl. 260-37.0SB.

Hess, John R.; and Asplund, Herbert Frederick, to United Technologies Corporation. Interblade damper and seal for turbomachinery rotor. 4,101,245, Cl. 416-190.000.

Hess, Robert L.: *See—*
Meyer, Jeffry R.; and Hess, Robert L., 4,101,748, Cl. 200-148.00A.

Hesse, Wolfgang; and Jacobi, Paul, to Hoechst Aktiengesellschaft. Process for hardening a resin which is the reaction product of an epoxy resin, an olefinically unsaturated monocarboxylic acid and a polycarboxylic acid anhydride unit. 4,101,398, Cl. 204-159.160.

Hetal-Werke Franz Hettich KG: *See—*
Krautter, Kurt, 4,100,648, Cl. 16-163.000.

Heveran, John Edward: *See—*
Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.

Hewlett-Packard Company: *See—*
Heldt, Earl R., 4,101,198, Cl. 350-96.200.
Neukermans, Armand Paul; and Kruger, William Paul, 4,101,781, Cl. 250-483.000.

Heye, Hermann: *See—*
Schaar, Lothar, 4,101,306, Cl. 65-323.000.

Hi-G Incorporated: *See—*
Drapeau, Donald R., 4,101,855, Cl. 335-106.000.

Hickam, William M., to Westinghouse Electric Corp. Detection of incipient faults in hydrogen-cooled generators. 4,101,277, Cl. 23-232.00R.

Hickle, William H., to United States of America, Navy. Strain actuated hydraulic holdback bar. 4,101,098, Cl. 244-63.000.

Hickle, William H., to United States of America, Navy. Repeatable release holdback bar. 4,101,099, Cl. 244-63.000.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.

Hilaire, Pierre; and Lonchampt, Georges, to Commissariat a l'Energie Atomique. Horizontal electrolyzers with mercury cathode. 4,101,407, Cl. 204-251.000.

Hildebrecht, Harold V., to Towmotor Corporation. Cradle for a differential. 4,100,987, Cl. 180-75.000.

Hildebrecht, Harold V., to Towmotor Corporation. Vehicle including differential mounting. 4,100,988, Cl. 180-75.000.

Hiles, Maurice Arthur Frederick, to National Research Development Corporation. Energy absorbing materials. 4,101,704, Cl. 428-218.000.

Hill, Boyce M.: *See—*
Jones, Kendall; and Hill, Boyce M., 4,100,629, Cl. 4-295.000.

Hill, Homer G.; and Pansius, William G., to Owens-Corning Fiberglas Corporation. Coated glass fibers. 4,101,334, Cl. 106-99.000.

Hill, Howard M., to Xerox Corporation. Method and apparatus for controlling the temperature of low pressure metal or metal halide lamps. 4,101,807, Cl. 315-116.000.

Hill, John I.: *See—*
Lurkis, Alexander; and Hill, John I., 4,101,876, Cl. 340-555.000.

Hinson, Virgil: *See—*
Jarman, Gladys T., 4,100,975, Cl. 173-91.000.

Hintermeier, Karl: *See—*
Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.

Hinterwaldner, Rudolf. Hardenable one-component substance, method of producing and hardening same and its application. 4,101,501, Cl. 260-40.00R.

Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, to U.S. Philips Corporation. Adjustable mount for electrostatic printer stylus within cylindrical printing roller. 4,101,908, Cl. 346-139.00C.

Hirayama, Tadamasa: *See—*
Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.

Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, to Kogyo Gijutsuin, President of. Magnetic bubble information writing device. 4,101,971, Cl. 365-11.000.

Hirsch, Harold H.; and Rairden, John R., III, to General Electric Company. Flame spray oxidation and corrosion resistant superalloys. 4,101,713, Cl. 428-554.000.

Hishinuma, Yukio: *See—*
Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.

Hitachi Cable, Ltd.: *See—*
Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.

Hitachi Chemical Company, Ltd.: *See—*
Tamura, Kohki; and Iwamoto, Kazuo, 4,101,718, Cl. 429-26.000.
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Hitachi, Ltd.: *See—*
Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.
Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.
Ishizuka, Kohei; and Kita, Yasuhiro, 4,101,851, Cl. 333-28.00R.
Kawaji, Mitsuo; Usui, Toshio; and Kawano, Masaichiro, 4,101,879, Cl. 340-324.0AD.
Kosugi, Hiroshi, 4,101,853, Cl. 333-70.00R.
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,101,841, Cl. 330-254.000.
Shimizu, Keizo; Maruyama, Takeshi; and Fujimura, Toshio, 4,101,878, Cl. 340-310.00R.
Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.
Tamura, Kohki; and Iwamoto, Kazuo, 4,101,718, Cl. 429-26.000.

Hitachi Maxell, Ltd.: *See—*
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.

Hitchinson, Patrick W.: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.

Hitco: *See—*
Shaffer, Robert C., 4,101,354, Cl. 156-60.000.

Hoare, Gordon Harold; and Lovegrove, Brian Walter, to Fisons Limited. Centrifuge rotor coupling. 4,101,070, Cl. 233-1.00R.

Hobart Corporation: *See—*
Brackman, Donald A., 4,101,977, Cl. 366-246.000.
Brackman, Donald A., 4,101,978, Cl. 366-314.000.

Hochstrasser, Otto: *See—*
Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, 4,101,724, Cl. 13-1.000.

Hodgkinson, John Hedley, to Coal Industry (Patents) Limited. Roof prop and platform movably mounted on boom of tunnelling machine. 4,101,173, Cl. 299-33.000.

Hodgson, James H., to Chromalloy American Corporation. Flail type manure spreader with adjustable hood. 4,101,078, Cl. 239-651.000.

Hoechst Aktiengesellschaft: *See—*
Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.
Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, 4,101,323, Cl. 96-35.000.
Frass, Werner, 4,101,327, Cl. 96-115.00P.
Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.
Hesse, Wolfgang; and Jacobi, Paul, 4,101,398, Cl. 204-159.160.
Schroter, Herbert, 4,101,918, Cl. 354-299.000.

Hoefer Scientific Instruments: *See—*
Hoefer, Stanton A., 4,101,401, Cl. 204-180.00G.

Hoefer, Stanton A., to Hoefer Scientific Instruments. Fluid isolation electrophoresis apparatus and method. 4,101,401, Cl. 204-180.00G.

Hoepfner, Voachim: *See—*
Tihanyi, Jenoe; and Hoepfner, Voachim, 4,101,922, Cl. 357-23.000.

Hoesch Werke Aktiengesellschaft: *See—*
Kowallik, Josef, 4,100,710, Cl. 52-309.900.

Hofer, Wolfgang O.; and Kirschner, Jurgen. Ion electron converter. 4,101,771, Cl. 250-397.000.

Hoffend, Thomas R.: *See—*
Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.

Hoffmann-La Roche Inc.: *See—*
Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.

Hofmann, Heinrich, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Combustion chamber system for the production of propelling gases. 4,100,836, Cl. 89-7.000.

Hogan, John P.; and Norwood, Donald D., to Phillips Petroleum Company. Polymerization process using spray dried titanium-containing catalyst. 4,101,722, Cl. 526-106.000.

Hogan, Robert Paul, II. Charcoal briquette packaging technique. 4,101,292, Cl. 44-40.000.

Hokari, Sadao: *See—*
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.

Hokkoku, Syusaburo: *See—*
Hasegawa, Masakatsu; and Hokkoku, Syusaburo, 4,101,435, Cl. 252-62.530.

Holik, Herbert: *See—*
Barp, Bruno; and Holik, Herbert, 4,100,683, Cl. 34-124.000.

Holland, James Brooks: *See—*
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,101,677, Cl. 424-330.000.

Hollander, Bruce L. Picture frame leveling device. 4,100,681, Cl. 33-389.000.

Holler, Fritz G.: *See—*
Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., 4,100,796, Cl. 73-160.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yamaguchi, Akio, 4,101,034, Cl. 206-612.000.

Honeywell Inc.: *See—*
Anderson, Rogers H., 4,101,331, Cl. 106-73.100.
Jacobsz, Roelof F., 4,101,258, Cl. 431-26.000.

Honig, Milton L., to Stauffer Chemical Company. Lead acetate impregnated magnesium silicate for the production of perchloromethyl mercaptan. 4,101,446, Cl. 252-430.000.

Honnold, Darrel Lee, to Deere & Company. Rotary hoe stripping means. 4,100,971, Cl. 172-547.000.

Hooper, Edwin B., Jr., to United States of America, Energy. Means for counteracting charged particle beam divergence. 4,101,765, Cl. 250-251.000.

Hopkins, Robert Sherman, Jr.: *See—*
Dischert, Robert Adams; Banks, Arthur James; and Hopkins, Robert Sherman, Jr., 4,101,926, Cl. 358-17.000.

Hopple Plastics, Inc.: *See—*
Wallace, Harry S.; and Taylor, Robert C., 4,101,049, Cl. 229-2.50R.

Horian, James G.: *See—*
Horian, Richard C.; and Horian, James G., 4,100,643, Cl. 15-246.000.

Horian, Richard C.; and Horian, James G. Magnetic tape sensing head cleaner. 4,100,643, Cl. 15-246.000.

Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, to Sumitomo Chemical Company, Limited. Process for producing alumina fiber or alumina-silica fiber. 4,101,615, Cl. 264-63.000.

Horinka, Paul R.: *See—*
Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., 4,101,544, Cl. 260-207.100.

Horowitz, Harold S.; and Longo, John M., to Exxon Research & Engineering Co. Use of high surface area mixed metal oxides of manganese and calcium in electrochemical processes. 4,101,716, Cl. 429-13.000.

Horsitmann, Hendrik. Fault indicator including a reed relay responsive to above normal current flow in a conductor. 4,101,826, Cl. 324-51.000.

Horst, William R.: *See—*
Hale, William J.; Horst, William R.; and Walker, Donald A., 4,101,905, Cl. 346-74.100.

Houk, William J., to Ranco Incorporated. Differential pressure operated switch. 4,101,747, Cl. 200-83.00A.

Houlihan, William J., to Sandoz, Inc. Imidazo[2,1-A]isoquinolines. 4,101,553, Cl. 260-288.0CF.

Housman, James H.: *See—*
Housman, Robert B., 4,100,962, Cl. 164-435.000.

Housman, Robert B., to Housman, James H. Casting die. 4,100,962, Cl. 164-435.000.

Howard, Leroy J., Jr., to UOP Inc. Method for drying a hydrocarbon conversion apparatus. 4,101,594, Cl. 260-668.00A.

Hoyle, James Franklin: *See—*
Costes, Michel Leon; and Hoyle, James Franklin, 4,101,743, Cl. 179-175.000.

Hradil, Jiri: *See—*
Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.

Huang, Wu-Cheng: *See—*
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Microbicidal alanine thioesters. 4,101,672, Cl. 424-301.000.

Hubner, Oswald: *See—*
Bauerle, Gerhard; and Hubner, Oswald, 4,101,192, Cl. 339-217.00S.

Hudson Pulp & Paper Corp.: *See—*
Zucker, Jerry, 4,101,535, Cl. 260-97.700.

Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., to American Color & Chemical Corporation. Water soluble monoazo dyes for polyamide material. 4,101,544, Cl. 260-207.100.

Hughes Aircraft Company: *See—*
Evans, Norol T., 4,101,889, Cl. 343-7.700.
Roesner, Bruce B.; and McGreivy, Denis J., 4,101,349, Cl. 148-175.000.
Seliger, Robert L., 4,101,782, Cl. 250-492.00B.
Yaggy, Leon S., 4,101,931, Cl. 358-217.000.

Hultsch, Gunther, to Krauss-Maffei Aktiengesellschaft. Centrifuge drum with lateral filtration. 4,101,421, Cl. 210-178.000.

Humphries, Peter E., to Contronic Controls Limited. Multi-satellite intrusion alarm control system. 4,101,875, Cl. 340-504.000.

Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., to Steel Company of Canada, Limited, The. Galvanizing steel strip in selected areas thereof. 4,101,345, Cl. 148-6.15R.
Hunts, Barney Dean: *See—*
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., to General Foods Limited. Dearomatization of coffee oil. 4,101,681, Cl. 426-387.000.
Huth, Kurt: *See—*
Geppert, Barbara; and Huth, Kurt, 4,101,047, Cl. 220-258.000.
Hutter Apparatebau AG: *See—*
Hutter, Felix Jakob, 4,101,783, Cl. 250-540.000.
Hutter, Felix Jakob, to Hutter Apparatebau AG. Ozone generator. 4,101,783, Cl. 250-540.000.
Huynh, Chanh: *See—*
Martel, Jacques; Huynh, Chanh; and Buendia, Jean, 4,101,574, Cl. 260-544.00L.
Hwa, Chih Ming; and Jacob, Jose T., to Chemed Corporation. Composition and method of inhibiting corrosion. 4,101,441, Cl. 252-389.00A.
Hwang, H. Shinn; and Taylor, Paul D., to Celanese Corporation. Catalyst for production of acetic acid. 4,101,450, Cl. 252-460.000.
Hybrid Systems Corporation: *See—*
De Freitas, Richard E., 4,101,881, Cl. 340-347.00R.
Hyman, Henry F. Hole repair kit. 4,100,712, Cl. 52-514.000.
I.T.E. Imperial Corporation: *See—*
Mooney, Thomas; and Shemtov, Sami, 4,101,103, Cl. 248-58.000.
Ibuka, Masaru: *See—*
Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.
Ichiki, Eiichi: *See—*
Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
ICI Americas Inc.: *See—*
Rutledge, Thomas F., 4,101,561, Cl. 260-396.00N.
Ick, Jurgen: *See—*
Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, 4,101,468, Cl. 521-115.000.
Iida, Kiichi: *See—*
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,101,324, Cl. 96-36.300.
Ikeda, Hiroshi: *See—*
Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.
Ikeda, Takeo: *See—*
Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.
Ikeda, Toshiki: *See—*
Inoue, Makoto; Ikeda, Toshiki; and Abe, Koichiro, 4,101,944, Cl. 360-85.000.
Ikrath, Gertrude, executrix: *See—*
Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.
Ikrath, Kurt, deceased (by Ikrath, Gertrude, executrix); Sexton, Paul; Pingitore, Peter; and Kennebeck, William, to United States of America, Army. Camouflaged dual-slot antenna. 4,101,896, Cl. 343-713.000.
Ilgner, Hartmut: *See—*
Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 4,101,645, Cl. 423-648.00A.
Imada, Yukio: *See—*
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
Imai, Toshihiro, to Olympus Optical Co., Ltd. Objective optical system for endoscopes. 4,101,196, Cl. 350-96.310.
IMC Chemical Group, Inc.: *See—*
Kindraka, James Alexander; and Gallagher, John Bernard, 4,101,539, Cl. 260-112.50R.
Purcell, Robert F.; and Selleck, James R., Jr., 4,101,433, Cl. 252-49.500.
Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., to Motorola, Inc. Personalizable read-only memory. 4,101,974, Cl. 365-96.000.
Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Method and apparatus for drawing optical fiber. 4,101,300, Cl. 65-2.000.
Imperial Chemical Industries Limited: *See—*
Whittam, Thomas Vincent; and Youll, Barry, 4,101,598, Cl. 260-668.00A.
Imperial, George R.: *See—*
Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.
Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, to Kao Soap Co., Ltd. 3-Amino-4-homoisotwistane and an acid addition salt thereof and a process for producing the same. 4,101,580, Cl. 260-563.00P.
Indiana University Foundation: *See—*
Glancy, John, 4,100,918, Cl. 128-80.00F.
Indicator Controls Corporation: *See—*
Gould, James S.; and Gould, Samuel, 4,101,191, Cl. 339-125.00R.
Industrie Koot B.V.: *See—*
Oskam, Aane Adriaan; and Koot, Hermanus Marinus Ignatius, 4,101,206, Cl. 350-289.000.
Informer, Inc.: *See—*
Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., 4,101,959, Cl. 364-200.000.
Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., to Massachusetts Institute of Technology. Surface acoustic wave devices for processing and storing signals. 4,101,965, Cl. 364-821.000.
Ingram, David Lee. Base fed, top-loaded vertical whip antenna. 4,101,898, Cl. 343-752.000.
Inland Container Corporation: *See—*
Watkins, Caesar E., 4,101,022, Cl. 206-45.140.
Inoue-Japax Research (IJR) Inc.: *See—*
Inoue, Kiyoshi, 4,101,405, Cl. 204-224.00M.
Inoue, Kenichi: *See—*
Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
Inoue, Kiyoshi, to Inoue-Japax Research (IJR) Inc. Shaping apparatus. 4,101,405, Cl. 204-224.00M.
Inoue, Makoto; Ikeda, Toshiki; and Abe, Koichiro. Magazine loading device for magnetic video recording and reproducing apparatus. 4,101,944, Cl. 360-85.000.
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, to Mitsubishi Chemical Industries Limited; and Nippon Shinyaku Company, Limited. 2-Aminomethyl-5-phenyloxazoles and the pharmaceutically acceptable acid addition salts thereof. 4,101,660, Cl. 424-250.000.
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, to Nissan Chemical Industries, Ltd. Process for the manufacture of a slurry containing highly concentrated phosphoric acid and calcium sulfate hemihydrate in a readily filterable form. 4,101,638, Cl. 423-320.000.
Institut Biokhimii I Fiziologii Mikroorganizmov: *See—*
Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, 4,101,079, Cl. 241-46.150.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
Vayssiere, Pierre; and Berthet, Aristide, 4,101,313, Cl. 75-60.000.
Interlake, Inc.: *See—*
McConnell, Kennedy, 4,101,233, Cl. 403-397.000.
International Business Machines Corporation: *See—*
Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, 4,101,976, Cl. 365-119.000.
Costes, Michel Leon; and Hoyle, James Franklin, 4,101,743, Cl. 179-175.000.
Dahlstrom, Mark Sorensen; and Simon, Paul, 4,101,906, Cl. 346-75.000.
Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, 4,101,008, Cl. 188-1.00B.
Hehl, Walter; and Matthaei, Horst, 4,101,009, Cl. 188-1.00B.
Jensen, Donald F.; Rosenthal, Arnold B.; and Ross, Charles O., 4,101,006, Cl. 400-144.300.
Litkenhus, John Robert; and Stafford, Donald Wayne, 4,101,224, Cl. 400-328.000.
Mathisen, Einar Skau, 4,101,222, Cl. 356-244.000.
International Harvester Company: *See—*
Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.
International Nickel Company: *See—*
Luch, Daniel, 4,101,385, Cl. 204-20.000.
International Paper Company: *See—*
Rieben, Horace Johnnie; and Taylor, Lawrence F., 4,101,048, Cl. 229-34.00R.
International Standard Electric Corporation: *See—*
Barsellotti, John Anthony, 4,101,740, Cl. 179-99.000.
Goyard, Pierre Jean-Marie, 4,101,890, Cl. 343-8.000.
Kunstatter, George, 4,101,741, Cl. 179-99.000.
International Tapetronics Corporation: *See—*
Jenkins, John P., 4,101,937, Cl. 360-76.000.
International Telephone and Telegraph Corporation: *See—*
Balkwill, John Treagus, 4,101,303, Cl. 65-31.000.
Bridenbaugh, Edwin Redmond, 4,101,735, Cl. 179-1.0HF.
Brody, Herbert M., 4,100,763, Cl. 62-238.000.
Whitaker, Donald Edward, 4,101,733, Cl. 178-58.00R.
Interstore Transfer Specialists, Inc.: *See—*
Dove, Douglas J. A., 4,101,052, Cl. 229-23.00R.
Inukai, Mitsuo: *See—*
Sasaki, Shiro; Inukai, Mitsuo; and Tokai Rika Denki Seisakusho K.K., 4,101,171, Cl. 297-389.000.
Inverni Della Beffa S.p.A.: *See—*
Bonati, Attilio, 4,101,652, Cl. 424-49.000.
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, to Minolta Camera Kabushiki Kaisha. Toner dispensing device with electrical integrating circuit. 4,101,214, Cl. 355-10.000.
Irrifrance: *See—*
Turion, Jean-Claude, 4,100,936, Cl. 137-596.200.
Irvin Industries, Inc.: *See—*
Wallin, Jan-Olof, 4,101,094, Cl. 242-107.40A.
Isgrig, Glenn W. Target amusement device. 4,101,127, Cl. 273-95.00B.
Ishida, Kazuo: *See—*
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
Ishida, Kiyohito: *See—*
Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.

Ishigaki, Yoshio: *See*—
Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.

Ishigami, Masashi: *See*—
Takahashi, Takuya; and Ishigami, Masashi, 4,101,626, Cl. 264-313.000.

Ishikawa, Keiichi, to Tokyo Shibaura Electric Co., Ltd. Fire prevention device for the fixing stage of an electrophotographic machine. 4,101,266, Cl. 432-46.000.

Ishikura, Koji: *See*—
Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.

Ishimaru, Toshiaki: *See*—
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Ishitsuka, Yoshio: *See*—
Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.

Ishiuchi, Hiroshi: *See*—
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.

Ishizuka, Kohei; and Kita, Yasuhiro, to Hitachi, Ltd. Variable equalizer. 4,101,851, Cl. 333-28.00R.

Ishizuka, Takashi; and Miwa, Naoki, to Nitto Electric Industrial Co., Ltd. Water-soluble heat-resistant insulating varnish. 4,101,488, Cl. 260-29.20N.

Isobe, Asao: *See*—
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. VIR control apparatus for color television receiver. 4,101,927, Cl. 358-27.000.

Itagaki, Hideaki: *See*—
Kamikura, Shigeo; Itagaki, Hideaki; and Kawaoka, Ryoiti, 4,100,768, Cl. 66-75.200.

Itoh, Yuzo: *See*—
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.

ITT Industries, Incorporated: *See*—
Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, 4,101,888, Cl. 343-7.0VM.
Nordin, Dag, 4,101,139, Cl. 277-22.000.

Iwabuchi, Syoichi: *See*—
Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, 4,101,361, Cl. 156-250.000.

Iwaki, Shinpachiro: *See*—
Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.

Iwamoto, Kazuo: *See*—
Tamura, Kohki; and Iwamoto, Kazuo, 4,101,718, Cl. 429-26.000.

Izon Corporation: *See*—
Yevick, George J., 4,101,188, Cl. 350-96.240.

J. I. Case Company: *See*—
Seaberg, David H.; and Kao, Gou-Lian, 4,100,738, Cl. 60-327.000.

J. M. Ney Company, The: *See*—
Burk, Bruce; and Burnett, Arthur P., 4,101,330, Cl. 106-45.000.

J. R. Simplot Company: *See*—
Bierman, Laurence William; and Long, Gary Lynn, 4,101,637, Cl. 423-309.000.

Jacob, Jose T.: *See*—
Hwa, Chih Ming; and Jacob, Jose T., 4,101,441, Cl. 252-389.00A.

Jacobi, Paul: *See*—
Hesse, Wolfgang; and Jacobi, Paul, 4,101,398, Cl. 204-159.160.

Jacobsz, Roelof F., to Honeywell Inc. Fuel burner sequencing device with safety checking means. 4,101,258, Cl. 431-26.000.

Jacque, Albert W.: *See*—
Cameron, Larry D.; and Jacque, Albert W., 4,100,692, Cl. 42-1.00L.

Jacques, James O., to Xerox Corporation. Track following servo system and track following code. 4,101,942, Cl. 360-77.000.

Jaeger, C. Rene: *See*—
Blackmer, David E.; and Jaeger, C. Rene, 4,101,849, Cl. 333-14.000.

Jaffe, Michael L.: *See*—
Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.

Jahn, Hans-Georg, to Heidelberger Druckmaschinen Aktiengesellschaft. Device for adjusting lateral and circumferential registry in rotary printing machines. 4,100,851, Cl. 101-248.000.

Jain, Atul: *See*—
United States of America, National Aeronautics and Space Administration; and Jain, Atul, 4,101,891, Cl. 343-17.2PC.

James, Roger Halsted: *See*—
Striebel, Edmund Emil; Koblish, Theodore Richard; Madden, Thomas Joseph; and James, Roger Halsted, 4,100,733, Cl. 60-39.74B.

Janes, Roderick Stewart; and Lloyd, Maurice Edward, to Lucas Industries Limited. Fuel control for a multi-engine gas turbine installation. 4,100,731, Cl. 60-39.150.

Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan, 4,101,664, Cl. 424-273.00R.
Heeres, Jan, 4,101,665, Cl. 424-273.00R.
Heeres, Jan, 4,101,666, Cl. 424-273.00R.

Japan Atomic Energy Research Institute: *See*—
Bingo, Kazuyoshi; and Kawai, Katsuo, 4,101,769, Cl. 250-361.00R.

Japan Society for Promotion of Machine Industry: *See*—
Fujishiro, Yuji; and Ohta, Hideo, 4,100,854, Cl. 101-415.100.

Jarman, Davis R.: *See*—
Jarman, Gladys T., 4,100,975, Cl. 173-91.000.

Jarman, Gladys T., to Jarman, Davis R.; and Hinson, Virgil. Power booster. 4,100,975, Cl. 173-91.000.

Jeff, Adolph L. Precision cutting tool. 4,100,677, Cl. 30-321.000.

Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, to U.S. Dynamics Corporation. Floating hook arrangement for an apparatus for bagging garments. 4,100,719, Cl. 53-241.000.

Jenkins, John P., to International Tapetronics Corporation. Automatic azimuth control for magnetic tape recording and reproducing apparatus. 4,101,937, Cl. 360-76.000.

Jenne, Gustav, to Jenne & Strahm AG fur Tiefbautechnik. Self-propelled pneumatic burrowing device. 4,100,980, Cl. 175-19.000.

Jenne, Richard L., to Texas Instruments Incorporated. Thermostatic switch and method of assembly. 4,101,861, Cl. 337-368.000.

Jenne & Strahm AG fur Tiefbautechnik: *See*—
Jenne, Gustav, 4,100,980, Cl. 175-19.000.

Jennen, Friedrich; and Tricoire, Jean, to Troponwerke Dinklage & Co. Thermographic plate for measuring temperature distributions. 4,101,696, Cl. 428-1.000.

Jensen, Carl Anton: *See*—
Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, 4,101,960, Cl. 364-200.000.

Jensen, Donald F.; Rosenthal, Arnold B.; and Ross, Charles O., to International Business Machines Corporation. Carrier traverse control for a serial printer. 4,101,006, Cl. 400-144.300.

Jentsch, Dietmar: *See*—
Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, 4,101,647, Cl. 424-5.000.

Jeschke, Willi; and Wirz, Arno, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet turn-over device for a first-form printing and perfecting press with clamping grippers. 4,101,122, Cl. 271-277.000.

Jeswine, Adolph. Vertical auger snow removal device. 4,100,687, Cl. 37-43.00K.

Jetco, Inc.: *See*—
Davis, Bill G., 4,100,910, Cl. 123-196.00S.

Jezl, James L.; and Peters, Edwin F., to Standard Oil Company a corporation of Indiana. Horizontal reactor for the vapor phase polymerization of monomers. 4,101,289, Cl. 23-288.00E.

Jochems, Pieter Johannes Wilhelmus: *See*—
Kooi, Else; Jochems, Pieter Johannes Wilhelmus; and Van Zanten, Adrianus Teunis, 4,101,344, Cl. 148-1.500.

Jockel, Heinz: *See*—
Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 4,101,376, Cl. 176-39.000.

Jogand, Patrick: *See*—
Berniolles, Jean-Marie; and Jogand, Patrick, 4,101,377, Cl. 176-40.000.

Johansson, Erik Karl Gustav, to Aktiebolaget Electrolux. Vacuum cleaner nozzle with rotatable comb-shaped part. 4,100,644, Cl. 15-397.000.

John Thomas Batts, Inc.: *See*—
Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., 4,101,059, Cl. 223-85.000.

Johns-Manville Corporation: *See*—
Arno, David Michael, 4,101,085, Cl. 242-18.00G.
Batts, Robert Lee, 4,101,695, Cl. 427-434.00D.
Ray, Richard James, Jr.; Kopy, Daniel Paul; and Rohweder, Theodore Richard, 4,101,700, Cl. 428-131.000.

Johnson, Anna M. Bedding. 4,100,632, Cl. 5-334.00R.

Johnson, Harlan B., to PPG Industries, Inc. Electrolytic method. 4,101,394, Cl. 204-77.000.

Johnson, Harlan B.; Martinsons, Aleksandrs; and Welch, Cletus N., to PPG Industries, Inc. Method of casting silicon. 4,101,624, Cl. 264-273.000.

Johnson, Joseph E., Jr.; and Warrell, Richard D., to Monsanto Company. Container and support clip combination. 4,101,043, Cl. 215-100.00R.

Johnson, Robert K.: *See*—
Peters, Mark A.; and Johnson, Robert K., 4,101,315, Cl. 75-104.000.

Jonathan Temple Incorporated: *See*—
Philips, Michael R., 4,100,866, Cl. 112-231.000.

Jones, Francis William: *See*—
Guise, Geoffrey Bruce; and Jones, Francis William, 4,101,272, Cl. 8-127.600.

Jones, Howard S., Jr., to United States of America, Army. Multifrequency antenna system integrated into a radome. 4,101,895, Cl. 343-708.000.

Jones, Howard S., Jr.; and Reggia, Frank, to United States of America, Army. Compact low-profile electrically small VHF antenna. 4,101,899, Cl. 343-788.000.

Jones, James Thomas. Convertible trailer for hauling grain and a harvesting machine. 4,101,158, Cl. 296-10.000.

Jones, Kendall; and Hill, Boyce M., to Viking Industries, Inc. Aircraft lavatory drain plug. 4,100,629, Cl. 4-295.000.

Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, to Coal Industry (Patents) Limited. Extraction of coal. 4,101,413, Cl. 208-8.000.

Jonsson, Erik Anselm: *See*—
Fernaeus, Sven Evert; and Jonsson, Erik Anselm, 4,101,255, Cl. 425-219.000.

Jordan, Ronald H. Carrying case for wrenches. 4,101,025, Cl. 206-377.000.

Josemans, Leonardus J.; and Swessel, John A., Jr., to Cutler-Hammer,

Inc. Electrical attachment of indicating lamp to terminals in electric switches. 4,101,749, Cl. 200-317.000.
Jos. Schneider & Co. Optische Werke: *See*—
Tesch, Karl, 4,101,202, Cl. 350-187.000.
Joy Manufacturing Company: *See*—
Wayment, William Ross, 4,101,333, Cl. 106-85.000.
Joyce, James W., to United States of America, Army. Fluidic partial pressure sensor. 4,100,789, Cl. 73-23.000.
Juch, Ernst: *See*—
Wienand, Michael; and Juch, Ernst, 4,101,689, Cl. 427-122.000.
Juelg, James Edwin, Jr. Shirt construction. 4,100,622, Cl. 2-115.000.
Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, to Gildemeister AG. Arrangement for automatically changing the clamping jaws of the chuck of a machine tool. 4,100,671, Cl. 29-568.000.
Jurin, Petr Ipatovich: *See*—
Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, 4,101,243, Cl. 415-201.000.
Jushkov, Jury Vasilievich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Artbauer, Jan, 4,101,728, Cl. 174-29.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Yamashita, Shiro, 4,101,848, Cl. 331-116.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kasuya, Tamotsu, 4,101,241, Cl. 415-113.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Nakayama, Shozo; Kurahashi, Masayuki; and Hattori, Mitsuhiro, 4,101,249, Cl. 417-269.000.
Nakayama, Shozo; Kurahashi, Masayuki; and Araki, Nobuyuki, 4,101,250, Cl. 417-269.000.
Suzuki, Osamu; Ueda, Shozo; and Tashiro, Ichiro, 4,100,722, Cl. 57-34.00R.
K.K. Tokai Rika Denki Seisakusho: *See*—
Takagi, Katsuyuki; and Asano, Chihiro, 4,101,862, Cl. 338-23.000.
Kaepernick, William A.: *See*—
Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.
Kagstrom, Rune. Locking device for well covers and the like. 4,101,154, Cl. 292-237.000.
Kahle Engineering Co.: *See*—
Napor, Carl A.; Krumm, Charles G.; and Kucich, Joseph, 4,100,667, Cl. 29-429.000.
Kahn, Alexander: *See*—
Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 4,100,719, Cl. 53-241.000.
Kahn, Lawrence P.: *See*—
Davey, John T.; and Kahn, Lawrence P., 4,100,933, Cl. 137-495.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Dorsey, Geoffrey A., Jr., 4,101,346, Cl. 148-6.270.
Kajita, Kozo: *See*—
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
Kalbag, Shrinath Sheshgiri: *See*—
Bhandari, Ashok Kumar; and Kalbag, Shrinath Sheshgiri, 4,101,562, Cl. 260-419.000.
Kaldenbach, Willem Paul, to Netherlands Offshore Company (Nederlandse Maatschappij voor Werken Buitengaats) B.V. Floating craft. 4,100,873, Cl. 114-125.000.
Kalmar Lans Landsting: *See*—
Ornberg, Stellan, 4,101,167, Cl. 297-328.000.
Kalopissis, Gregoire; and Bugaut, Andree, to L'Oreal. 2-Carbamylmethyl-or (diethylcarbamyl)methyl-amino-4-hydroxy toluene and process for preparing the same. 4,101,576, Cl. 260-559.00A.
Kalt Manufacturing Company: *See*—
Fischer, Donald A., 4,100,638, Cl. 10-15.000.
Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, to Warner-Lambert. Novel antibacterial amide compounds and process means for producing the same. 4,101,661, Cl. 424-266.000.
Kamada, Hidemoto; Miura, Chiaki; and Utena, Makoto, to Calpis Shokuhin Kogyo Kabushiki Kaisha. Process for manufacture of fast cooking rice. 4,101,683, Cl. 426-618.000.
Kamens, Ernest Rudolph; Kressin, Donald Milton; Lange, Harold Carl; and MacLeay, Ronald Edward, to Pennwalt Corporation. Process for preparing foamed solids using two or more azo compounds. 4,101,464, Cl. 521-88.000.
Kameyama, Tadao: *See*—
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
Kamholz, Kenneth: *See*—
Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, 4,101,287, Cl. 23-288.00K.
Kamikura, Shigeo; Itagaki, Hideaki; and Kawaoka, Ryoiti, to Silver Seiko Co., Ltd. Method and apparatus of selecting needles of a knitting machine. 4,100,768, Cl. 66-75.200.
Kanebo, Ltd.: *See*—
Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, 4,101,621, Cl. 264-182.000.
Kaneko, Hideaki; Miyazaki, Yasushi; and Suzuki, Masanori, to Oxy Metal Industries Corporation. Treatment of zinc surfaces. 4,101,339, Cl. 134-2.000.
Kaneko, Kunio: *See*—
Nagasawa, Hiroyuki; and Kaneko, Kunio, 4,101,920, Cl. 357-17.000.
Kaneko, Tadao: *See*—
Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
Kanomata, Ichiro: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.
Kantor, Frederick W. Rotary thermodynamic apparatus. 4,100,765, Cl. 62-499.000.
Kao, Gou-Lian: *See*—
Seaberg, David H.; and Kao, Gou-Lian, 4,100,738, Cl. 60-327.000.
Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.
Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,101,518, Cl. 528-100.000.
Kapitanov, Nikolai Nikolaevich; and Tsatsanidi, Kim Nikolaevich. Surgical instrument for ligating tubular organs in deep cavities. 4,101,063, Cl. 227-19.000.
Kapplinger, Lawrence E., to Advanced Engineering & Manufacturing Company, Inc. Stock waterer. 4,100,885, Cl. 119-73.000.
Karch, John A.: *See*—
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.
Karol, Frederick John: *See*—
Levine, Isaac Jacob; and Karol, Frederick John, 4,101,445, Cl. 252-429.00R.
Karpati, Egon: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.
Kaspers, Helmut: *See*—
Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, 4,101,575, Cl. 260-553.00E.
Kasuya, Tamotsu, to Kabushiki Kaisha Komatsu Seisakusho. Super charger with fluid biased heat shroud. 4,101,241, Cl. 415-113.000.
Katchman, Arthur: *See*—
Cooper, Glenn Dale; and Katchman, Arthur, 4,101,503, Cl. 260-42.180.
Cooper, Glenn Dale; and Katchman, Arthur, 4,101,504, Cl. 260-42.180.
Cooper, Glenn Dale; and Katchman, Arthur, 4,101,505, Cl. 260-42.180.
Kaufmann, Helmut: *See*—
Kops, Friedrich; Kaufmann, Helmut; and Schymetzko, Karl-Heinz, 4,101,620, Cl. 264-177.00R.
Kavadias, Gerry; and Belleau, Bernard R., to Bristol-Myers Company. Total synthesis of 2,5-dideoxystreptamines. 4,101,556, Cl. 260-307.00C.
Kawabe, Mitsuhiro: *See*—
Maeda, Yutaka; and Kawabe, Mitsuhiro, 4,101,817, Cl. 318-603.000.
Kawabuchi, Masami: *See*—
Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, 4,101,795, Cl. 310-336.000.
Kawai, Katsuo: *See*—
Bingo, Kazuyoshi; and Kawai, Katsuo, 4,101,769, Cl. 250-361.00R.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,100,831, Cl. 84-1.010.
Kawaji, Mitsuo; Usui, Toshio; and Kawano, Masaichiro, to Hitachi, Ltd. Cursor movement control device for screen-segmented display apparatuses. 4,101,879, Cl. 340-324.0AD.
Kawamoto, Tadashi: *See*—
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,101,324, Cl. 96-36.300.
Kawano, Masaichiro: *See*—
Kawaji, Mitsuo; Usui, Toshio; and Kawano, Masaichiro, 4,101,879, Cl. 340-324.0AD.
Kawaoka, Ryoiti: *See*—
Kamikura, Shigeo; Itagaki, Hideaki; and Kawaoka, Ryoiti, 4,100,768, Cl. 66-75.200.
Kay Laboratories, Inc.: *See*—
Watson, Susan Steves, 4,101,353, Cl. 156-49.000.
Kayson, Walter, to Eastman Kodak Company. Magnetic curtain seal for development apparatus. 4,101,211, Cl. 355-3.0DD.
Kazuhiko, Ohashi: *See*—
Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
Kazuyuki, Maekawa: *See*—
Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, to Boehringer Ingelheim GmbH. Aminobenzyl-amines and salts thereof. 4,101,671, Cl. 424-330.000.
Keegan, Jack J.: *See*—
Reeves, George I.; and Keegan, Jack J., 4,101,859, Cl. 336-90.000.
Keene Corporation: *See*—
Crane, Roy B., 4,101,956, Cl. 362-217.000.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Voss, Hans Werner; and Kluting, Bernd, 4,101,110, Cl. 248-395.000.

Kelley, Larry P.; and Hardy, Craig A. Centrifugal forming thin films and semiconductors and semiconductor devices. 4,101,925, Cl. 357-68.000.

Kelly, William Tolson, III; and Stahl, Francis, to Union Carbide Corporation. Multi-cell battery charger. 4,101,818, Cl. 320-2.000.

Kemper, Yves Jean, to Vadetec Corporation. Variable displacement piston engine. 4,100,815, Cl. 74-60.000.

Kendall Company, The: *See*—
Layton, Terry N., 4,100,802, Cl. 73-215.000.

Kennebeck, William: *See*—
Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.

Kent, John Hugh; and Fell, Peter Howard, to Plessey Handel und Investments A.G. Connectors for coaxially coupling the end of a linear optical waveguide element for a receiving surface. 4,101,197, Cl. 350-96.170.

Kent, Jerry B.; and Augostini, Peter P., to Wobaco Trust, Ltd. Trustee. Tire sealing and balancing agent. 4,101,494, Cl. 260-29.60B.

Keul, Robert: *See*—
Fischer, Klaus; and Keul, Robert, 4,101,705, Cl. 428-220.000.

Key, Paul Franklyn; and Lazzara, Anthony Ross, to Scientific Technology Incorporated. Color mark detector. 4,101,784, Cl. 250-555.000.

Khattab, Ghazi; and Naviello, Gerard P., to GAF Corporation. Interpolymers of poly (butylene terephthalate). 4,101,502, Cl. 260-40.00R.

Khenkin, Veniamin Yakovlevich: *See*—
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Khlebnikov, Valentin Petrovich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Kidawara, Atsushi: *See*—
Maitani, Yoshihisa; and Kidawara, Atsushi, 4,101,911, Cl. 354-53.000.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.

Kildjushev, Valery Alexeevich: *See*—
Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich, 4,101,725, Cl. 13-18.000.

Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, to Hercules Incorporated. Method of making network structures. 4,101,358, Cl. 156-167.000.

Kim, Raymond W. H.; Lodge, Edward H.; and Lueders, Arthur L., to Bell & Howell Company. Drive control apparatus for motion picture projector. 4,101,097, Cl. 242-205.000.

Kim, Yang J.; and Williams, Belton R., to Unitech Chemical Inc. Rerefining of used motor oils. 4,101,414, Cl. 208-18.000.

Kimber, Geoffrey Michael: *See*—
Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, 4,101,413, Cl. 208-8.000.

Kimura, Shiro G., to General Electric Company. Production of hot, saturated fuel gas. 4,101,294, Cl. 48-77.000.

Kindraka, James Alexander; and Gallagher, John Bernard, to IMC Chemical Group, Inc. Bacitracin recovery process. 4,101,539, Cl. 260-112.50R.

King, David P.: *See*—
Barker, Robert I.; and King, David P., 4,101,612, Cl. 264-22.000.

King, Donald L. Three-dimensional ultrasonic imaging of animal soft tissue. 4,100,916, Cl. 128-2.00V.

King, Gerard J.; and Martino, Joseph F., to United States of America, Army. Method of preparation of SOS extrinsic infrared detector and read-out device. 4,100,672, Cl. 29-577.00C.

Kinoshita, Masayuki: *See*—
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.

Kiraly, Ildiko: *See*—
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.

Kirby, Thomas J., to GTE Sylvania Incorporated. Variable phase shifting apparatus. 4,101,821, Cl. 323-119.000.

Kircher, Morton S.; and Engler, Maynard F., to Olin Corporation. Electrode assembly with flexible gas baffle conductor. 4,101,410, Cl. 204-282.000.

Kirkpatrick, Robert Duncan; and Weiler, David William, to Union Carbide Corporation. Liquid-gas contacting tray. 4,101,610, Cl. 261-110.000.

Kirschner, Jurgen: *See*—
Hofer, Wolfgang O.; and Kirschner, Jurgen, 4,101,771, Cl. 250-397.000.

Kishimoto, Akira: *See*—
Ueno, Hiroshi; Otsuka, Shinya; Tsukamoto, Tetsuo; and Kishimoto, Akira, 4,101,534, Cl. 260-857.0TW.

Kita, Toru; and Fujishiro, Takeshi, to Nissan Motor Company, Limited. Sensor for detecting variation in oxygen concentration in gas. 4,101,403, Cl. 204-195.00S.

Kita, Yasuhiro: *See*—
Ishizuka, Kohei; and Kita, Yasuhiro, 4,101,851, Cl. 333-28.00R.

Kitaev, Evgeny Mitrofanovich: *See*—
Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich, 4,101,725, Cl. 13-18.000.

Kitamoto, Tatsuji: *See*—
Tadokoro, Eiichi; and Kitamoto, Tatsuji, 4,101,948, Cl. 360-137.000.

Kiwior, Alexander Michael, to Bendix Corporation, The. Fuel inlet assembly for a fuel injection valve. 4,101,074, Cl. 239-585.000.

Klein, Thomas A., to Lear Siegler, Inc. Shelf clip. 4,101,108, Cl. 248-243.000.

Klekamp, William H.: *See*—
Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., 4,101,251, Cl. 417-313.000.

Klippan GmbH Hamburg: *See*—
Minolla, Horst, 4,100,657, Cl. 24-230.0AL.

Klopfenstein, King L.; and Connors, Robert H., to Triangle Package Machinery Co. Net weigher with built-in checkweigher. 4,100,984, Cl. 177-50.000.

Klose, Odo; and von Schuckmann, Alfred. Reclining furniture. 4,100,630, Cl. 5-66.000.

Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, to Boehringer Mannheim GmbH. Method and reagent for the determination of substances forming hydrogen peroxide. 4,101,381, Cl. 195-99.000.

Klucznik, Paul J.: *See*—
Culbertson, Richard; and Klucznik, Paul J., 4,101,089, Cl. 242-85.100.

Kluting, Bernd: *See*—
Voss, Hans Werner; and Kluting, Bernd, 4,101,110, Cl. 248-395.000.

Knapp, Heinrich: *See*—
Eckert, Konrad; Knapp, Heinrich; and Stumpp, Gerhard, 4,100,904, Cl. 123-139.0AW.

Knapp, Walter: *See*—
Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, 4,101,217, Cl. 355-38.000.

Knecht, Rudolf: *See*—
Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, 4,101,384, Cl. 195-142.000.

Knopka, Williamm N., to Avtex Fibers Inc. Copolyesters of ethylene 2,6-naphthalene dicarboxylate and halogenated comonomers. 4,101,528, Cl. 260-45.75R.

Knudsen, Walter Ganter, to Electrostatic Equipment Corporation. Electrostatic coating method. 4,101,687, Cl. 427-25.000.

Kobayashi, Hiroshi: *See*—
Matsuno, Yoshiyuki; Kobayashi, Hiroshi; and Watanabe, Ryo, 4,100,872, Cl. 114-73.000.

Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, to Meiji Seika Kaisha, Ltd. Process for preparing preparations for oral administration. 4,101,651, Cl. 424-35.000.

Kobe, Inc.: *See*—
Erickson, John W., 4,101,246, Cl. 417-171.000.

Kober, Marvin; and Dvorak, Jarda, to OK Machine & Tool Corp. IC Insertion tool. 4,100,670, Cl. 29-564.100.

Koblish, Theodore Richard: *See*—
Striebel, Edmund Emil; Koblish, Theodore Richard; Madden, Thomas Joseph; and James, Roger Halsted, 4,100,733, Cl. 60-39.74B.

Kochetkov, Vladimir Alexeevich: *See*—
Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich, 4,101,725, Cl. 13-18.000.

Kodama, Fumio: *See*—
Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, 4,101,311, Cl. 75-0.500.

Koehn, Leland. Vertically swingable camper shell. 4,101,162, Cl. 296-137.00B.

Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Manufacture of sulfamic acid halides. 4,101,571, Cl. 260-543.00R.

Koga, Moriro: *See*—
Yamamoto, Iwao; and Koga, Moriro, 4,101,797, Cl. 313-141.000.

Kogure, Yasuzi: *See*—
Yamashita, Maki; and Kogure, Yasuzi, 4,101,914, Cl. 354-128.000.

Kogyo Gijutsuin, President of: *See*—
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
Saito, Nobuo; Yoshizawa, Shigeru; and Toyooka, Takashi, 4,101,970, Cl. 365-2.000.

Kohama, Tokio: *See*—
Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, 4,100,734, Cl. 60-278.000.

Kohl, Lambert; Schneider, Richard; and Uhl, Karl, to BASF Aktiengesellschaft. Magazine for a plurality of recording media. 4,101,027, Cl. 206-309.000.

Kohler, Walter, to Norte-Klessmann & Co. K.G. Temperature compensated measuring device. 4,100,837, Cl. 90-11.00R.
Kohn, Jean: *See*—
Roberts, Wm. Mel; and Kohn, Jean, 4,101,045, Cl. 220-404.000.
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Nambu, Masao; Yamamoto, Syunichi; and Koiwai, Yoshihisa, 4,101,635, Cl. 423-242.000.
Koizumi, Toshimichi; and Unami, Miwako, to Olympus Optical Co., Ltd. Medium magnification objective for video disks. 4,101,204, Cl. 350-224.000.
Kokoshi Electric Co.: *See*—
Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, 4,101,275, Cl. 23-230.00R.
Koleske, Joseph Victor: *See*—
Smith, Oliver Wendell; and Koleske, Joseph Victor, 4,101,603, Cl. 260-850.000.
Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., to International Harvester Company. Automotive fan shroud for screening debris. 4,100,965, Cl. 165-119.000.
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Durr, Ernst, 4,101,856, Cl. 335-135.000.
Kommrusch, Richard Stephen, to Motorola, Inc. Interleaved antenna array for use in a multiple input antenna system. 4,101,901, Cl. 343-853.000.
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Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
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Sumiyoshi, Keiji; and Saitoh, Tomio, 4,101,212, Cl. 355-3.0TR.
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Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.
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Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,101,518, Cl. 528-100.000.
Kontinen, Martti. Folded seal for plastic sheeting and forming apparatus. 4,100,717, Cl. 53-138.00R.
Kooi, Else; Jochems, Pieter Johannes Wilhelmus; and Van Zanten, Adrianus Teunis, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,101,344, Cl. 148-1.500.
Koot, Hermanus Marinus Ignatius: *See*—
Oskam, Aane Adriaan; and Koot, Hermanus Marinus Ignatius, 4,101,206, Cl. 350-289.000.
Kopelman, Donald F.: *See*—
Oberhardt, Bruce J.; and Kopelman, Donald F., 4,100,797, Cl. 73-194.00E.
Koprich, Stephen R.: *See*—
Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.
Kops, Friedrich; Kaufmann, Helmut; and Schymetzko, Karl-Heinz, to Dynamit Nobel Aktiengesellschaft. Process for producing a plastic sheet having parallel ribs extruding from both surfaces. 4,101,620, Cl. 264-177.00R.
Kopy, Daniel Paul: *See*—
Ray, Richard James, Jr.; Kopy, Daniel Paul; and Rohweder, Theodore Richard, 4,101,700, Cl. 428-131.000.
Korber, Kurt A., to Hauni-Werke Korber & Co. KG. Method and machine for producing filter elements for tobacco smoke. 4,100,845, Cl. 93-77.0FT.
Korenyak, Nikolai Kalistratovich: *See*—
Surovikin, Vitaly Fedorovich; Sazhin, Gennady Vasilievich; Romanov, Mikhail Ivanovich; and Korenyak, Nikolai Kalistratovich, 4,101,639, Cl. 423-449.000.
Korger, Heinz, to Marker, Hannes. Ski brake. 4,101,145, Cl. 280-605.000.
Korobov, Oleg Evgenievich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
Korose, John: *See*—
Krause, Arthur Waldemar; and Korose, John, 4,101,293, Cl. 44-51.000.
Korsch, Dietrich G.: *See*—
United States of America, National Aeronautics and Space Administration; and Korsch, Dietrich G., 4,101,195, Cl. 350-55.000.
Koryagin, Mikhail Andreevich: *See*—
Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, 4,101,243, Cl. 415-201.000.
Koseki, Isamu; and Seimiya, Motoo, to Tokyo Shibaura Electric Co., Ltd. Method for preparing tungsten materials. 4,101,309, Cl. 75-0.5AB.
Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Arkadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna. Synthetic rubber mix. 4,101,478, Cl. 260-23.00S.
Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, to Nippon Soken, Inc. Fuel injection systems for internal combustion engines of spark ignition type. 4,100,902, Cl. 123-139.0BC.
Kosugi, Hiroshi, to Hitachi, Ltd. Frequency sampling filter. 4,101,853, Cl. 333-70.00R.
Kotzsch, Hans-Joachim; Muller, Gerhard; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of alpha-chloromethylsilanes. 4,101,397, Cl. 204-158.0HA.
Kowallik, Josef, to Hoesch Werke Aktiengesellschaft. Tongue-groove connection. 4,100,710, Cl. 52-309.900.
Koychev, Todor Yankov: *See*—
Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, 4,101,186, Cl. 339-5.00S.
Kozak, Peter J.: *See*—
Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., 4,101,557, Cl. 260-327.00E.
Kozlowski, Peter F., to A. W. Chesterton Company. Braided packing. 4,100,835, Cl. 87-1.000.
Kramer, Erich, to Bayer Aktiengesellschaft. Process for the selective destruction, by reduction, of p-coupled products of the 1-naphthol series. 4,101,542, Cl. 260-158.000.
Kramer, Manfred, to Robert Bosch GmbH. Fuel injection system. 4,100,901, Cl. 123-139.0AW.
Kramer, Melvin G., to Brunton Company, The. Data read-out system and apparatus useful for angular measurements. 4,101,882, Cl. 340-347.00P.
Kranefeld, Wilhelm; and Schneider, Helmut, to O & K Orenstein & Koppel Aktiengesellschaft. Telescopic boom for portable cranes. 4,100,707, Cl. 52-115.000.
Krankkala, George E.: *See*—
Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., 4,101,513, Cl. 526-193.000.
Kraus, Wayne A. Wood finishing process. 4,101,694, Cl. 427-399.000.
Krause, Arthur Waldemar; and Korose, John, to Reichhold Chemicals, Inc. Stabilizing emulsifiers. 4,101,293, Cl. 44-51.000.
Krause, Peter: *See*—
Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, 4,101,280, Cl. 23-288.0FC.
Krauss-Maffei Aktiengesellschaft: *See*—
Hultsch, Gunther, 4,101,421, Cl. 210-178.000.
Krautter, Kurt, to Hetal-Werke Franz Hettich KG. Hinge. 4,100,648, Cl. 16-163.000.
Kreibich, Ursula: *See*—
Schmid, Rolf; and Kreibich, Ursula, 4,101,476, Cl. 260-22.0EP.
Kren, George J.: *See*—
Denison, Dean R.; and Kren, George J., 4,101,874, Cl. 340-606.000.
Kreske, Alvin, Jr. Panel formed of hollow plastic balls containing a fire retardant liquid. 4,100,970, Cl. 169-57.000.
Kressin, Donald Milton: *See*—
Kamens, Ernest Rudolph; Kressin, Donald Milton; Lange, Harold Carl; and MacLeay, Ronald Edward, 4,101,464, Cl. 521-88.000.
Kressley, Leonard J.: *See*—
Frevel, Ludo K.; and Kressley, Leonard J., 4,101,451, Cl. 252-465.000.
Krist, John. Automatic transmission. 4,100,823, Cl. 74-863.000.
Kroeber, Wilhelm. Cassette. 4,101,030, Cl. 206-398.000.
Krohn, David A.; and Deeg, Emil W., to American Optical Corporation. Photochromic gradient lenses. 4,101,302, Cl. 65-30.00R.
Kromer, Gunter, to Audi Nsu Auto Union Aktiengesellschaft. Rotary piston internal combustion engine. 4,100,911, Cl. 123-205.000.
Kromm, Alvin D., Jr.: *See*—
Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., 4,101,267, Cl. 432-60.000.
Kruger, Gerd: *See*—
Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.
Kruger, Manfred; Schreyer, Gerd; and Weiberg, Otto, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of percarboxylic acid solutions in organic solvents. 4,101,570, Cl. 260-502.00R.
Kruger, William Paul: *See*—
Neukermans, Armand Paul; and Kruger, William Paul, 4,101,781, Cl. 250-483.000.
Krumm, Charles G.: *See*—
Napor, Carl A.; Krumm, Charles G.; and Kucich, Joseph, 4,100,667, Cl. 29-429.000.
Krutilla, Michael A.: *See*—
Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., 4,100,961, Cl. 164-180.000.
Kuanoni, Clement: *See*—
Hansenwinkle, Earl Dean; Kuanoni, Clement; and Wislocker, Frank, 4,101,372, Cl. 156-580.000.
Kubota, Ltd.: *See*—
Nakano, Keiichi; and Nakai, Kouji, 4,100,909, Cl. 123-196.0AB.
Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,101,508, Cl. 260-45.80N.
Kucich, Joseph: *See*—
Napor, Carl A.; Krumm, Charles G.; and Kucich, Joseph, 4,100,667, Cl. 29-429.000.
Kuck, David Jerome: *See*—
Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, 4,101,960, Cl. 364-200.000.
Kudeyarova, Emilia Stanislavovna: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Koro-

bov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Kudrikova, Evdokia Danilovna: *See*—
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.

Kugler, Siegfried: *See*—
Muller, Dieter; Endlich, Wilhelm; and Kugler, Siegfried, 4,100,954, Cl. 151-41.700.

Kuhnert, Gottfried, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Flat knitting machine having four opposed needle beds. 4,100,766, Cl. 66-64.000.

Kuklev, Vladimir Petrovich: *See*—
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Kulite Tungsten Corporation: *See*—
Kurtz, Ronald A.; and Utzinger, Henry P., 4,101,126, Cl. 273-95.00R.

Kull, George A., to ACF Industries, Incorporated. Railway hopper car for unloading ladings which do not readily fluidize. 4,101,175, Cl. 302-53.000.

Kulwicki, Bernard M.; and St.Martin, Norman P., to Texas Instruments Incorporated. Ceramic semiconductors. 4,101,454, Cl. 252-514.000.

Kumiai Chemical Industry Co., Ltd.: *See*—
Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, 4,101,670, Cl. 424-300.000.

Kummer, Rudolf: *See*—
Nienburg, Hans Juergen; and Kummer, Rudolf, 4,101,588, Cl. 260-615.00A.

Kunstatter, George, to International Standard Electric Corporation. Line circuit for key telephone systems. 4,101,741, Cl. 179-99.000.

Kuntschik, Lawrence F., to Texaco Inc. Turbine lubricant. 4,101,431, Cl. 252-46.700.

Kunz, Paul. Method and apparatus for steam peeling produce. 4,101,682, Cl. 426-482.000.

Kunz, Walter: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,101,672, Cl. 424-301.000.

Kupfer, Hans: *See*—
Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 4,101,376, Cl. 176-39.000.

Kurahashi, Masayuki: *See*—
Nakayama, Shozo; Kurahashi, Masayuki; and Hattori, Mitsuhiro, 4,101,249, Cl. 417-269.000.
Nakayama, Shozo; Kurahashi, Masayuki; and Araki, Nobuyuki, 4,101,250, Cl. 417-269.000.

Kuriyama, Ryozo: *See*—
Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.

Kurtz, Ronald A.; and Utzinger, Henry P., to Kulite Tungsten Corporation. Game darts and dartboards employing anti-bounce-off apparatus. 4,101,126, Cl. 273-95.00R.

Kurtzman, Martin E. Method for printing braille characters by lithography. 4,101,688, Cl. 427-56.000.

Kusama, Tsuneo: *See*—
Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.

Kusao, Kenji: *See*—
Konishi, Fumiya; Kusao, Kenji; and Yoshioka, Yoshiaki, 4,101,772, Cl. 250-399.000.

Kuss Corporation: *See*—
Benjamin, Gary L., 4,100,634, Cl. 5-365.000.

Kusumoto, Shoichi: *See*—
Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.

Kuus, Gijsbert; and Tielemans, Peter Andreas, Waltherus, to U.S. Philips Corporation. High-pressure discharge lamp. 4,101,796, Cl. 313-178.000.

Kuze, Saburo, to Murata Manufacturing Co., Ltd. Variable capacitor. 4,101,951, Cl. 361-293.000.

Labconco Corporation: *See*—
Norton, Robert O., 4,100,847, Cl. 98-115.0LH.

Labofina S.A.: *See*—
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,101,599, Cl. 260-683.900.

Labrue, Jean-Marie. Method for the production of piles cast in the ground and hollow auger for implementing the method. 4,100,750, Cl. 61-53.640.

Lacy, Larry D.: *See*—
Patterson, Robert A.; and Lacy, Larry D., 4,101,958, Cl. 364-200.000.

Lafferty, Robert M.; and Heinzle, Elmar, to Agroferm AG. Cyclic carbonic acid esters as solvents for poly-(β-hydroxybutyric acid. 4,101,533, Cl. 528-491.000.

Lagos, Dickens M.: *See*—
Lomasney, Henry L.; Lomasney, William J.; Metil, Ignatius; and Lagos, Dickens M., 4,101,692, Cl. 427-333.000.

Lakatos, Charles, to Fantasia Confections, Inc. Sheet cake cutter. 4,100,830, Cl. 83-371.000.

Lamberti, Thomas G.; and Rowe, Harry B., to Aluminum Company of America. Waste gas incineration control. 4,101,632, Cl. 423-210.000.

Lambeth, David Noel, to Eastman Kodak Company. Narrow track magnetic-head recorder. 4,101,947, Cl. 360-114.000.

Lamont, James; and Braun, Robert J., to Emery Industries, Inc. Copolyesters useful in blood separation assemblies. 4,101,422, Cl. 210-84.000.

Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, to Singer Company, The. Programmable sewing machine operable in a plurality of modes. 4,100,865, Cl. 112-121.110.

Landecker, Kurt. Thermoelectric element. 4,101,342, Cl. 136-228.000.

Lander, Harry L., to Story Chemical Corporation. Solid particle-form polymerizable polymeric material and compositions, structures and methods of employing and producing the same. 4,101,473, Cl. 260-13.000.

Landis, Joel Victor, to Petrolite Corporation. Process for refining crude oil. 4,101,563, Cl. 260-425.000.

Landsinger, Edmund Emil: *See*—
Shih-Teng Chang, Richard; and Landsinger, Edmund Emil, 4,100,728, Cl. 58-74.000.

Landsittel, David Thomas, to Mansol Ceramics Company. Novel method and apparatus for hermetic encapsulation for integrated circuits and the like. 4,100,675, Cl. 29-627.000.

Langdon, Jack M.: *See*—
Bracey, Jep T., 4,101,608, Cl. 261-36.00R.

Lange, Harold Carl: *See*—
Kamens, Ernest Rudolph; Kressin, Donald Milton; Lange, Harold Carl; and MacLeay, Ronald Edward, 4,101,464, Cl. 521-88.000.

Lange, Karl Heinz, to Balda-Werke. Gearing for camera operation. 4,101,915, Cl. 354-144.000.

Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Packaging machine transfer mechanism. 4,101,020, Cl. 198-478.000.

Langley, Gregory A. Belt buckle. 4,100,655, Cl. 24-163.00K.

LaNieve, Herman L., III: *See*—
Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.

Lantzsch, Reinhard: *See*—
Uhrhan, Paul; Lantzsch, Reinhard; Oertel, Harald; Roos, Ernst; and Arlt, Dieter, 4,101,506, Cl. 260-45.80N.

Larry, John Robert, to Du Pont de Nemours, E. I., and Company. Resistor compositions. 4,101,708, Cl. 428-432.000.

Larson, Harold V.; and Clark, Morris E., to Olin Corporation. Defluorinated phosphate rock process using lime. 4,101,636, Cl. 423-305.000.

Laskowski, Kenneth W.; and Steiner, Edward L., to Xerox Corporation. Zoom lens copier. 4,101,213, Cl. 355-5.000.

Laumond, Yves: *See*—
Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.

Lautenschlager, Wolfgang: *See*—
Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, 4,101,384, Cl. 195-142.000.

Lawson, Leslie Edward, to Vickers Limited. Lithographic plate ink receptivity improving composition and method. 4,101,322, Cl. 96-33.000.

Lawson, Nelson E., to Union Camp Corporation. Radiation curable acrylic resin compositions. 4,101,477, Cl. 260-22.0CB.

Lawson, Roger E.; and Richesson, Maurice A., to Digital Equipment Corporation. Secondary storage facility with means for monitoring sector pulses. 4,101,969, Cl. 364-900.000.

Layton, Terry N., to Kendall Company, The. Liquid measuring device. 4,100,802, Cl. 73-215.000.

Lazar, Benjamin E. Inflatable cartop carrier and shelter structure. 4,101,062, Cl. 296-37.700.

Lazov, Lyuben Kostov: *See*—
Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, 4,101,186, Cl. 339-5.00S.

Lazzara, Anthony Ross: *See*—
Key, Paul Franklyn; and Lazzara, Anthony Ross, 4,101,784, Cl. 250-555.000.

Lear Siegler, Inc.: *See*—
Klein, Thomas A., 4,101,108, Cl. 248-243.000.
Zawacki, Joseph H.; and Dutton, John P., 4,100,781, Cl. 72-41.000.

Leavines, Joseph E. Method of making high temperature parallel resistance pipe heater. 4,100,673, Cl. 29-611.000.

Lebedeva, Nelli Alexandrovna: *See*—
Bobrov, Vladimir Timofeevich; Druzhaev, Jury Avraamovich; and Lebedeva, Nelli Alexandrovna, 4,100,809, Cl. 73-638.000.

LeBlanc, Raymond C.: *See*—
Smith, David W.; LeBlanc, Raymond C.; and Oliver, J. Allen, 4,101,100, Cl. 244-114.00R.

Lecolier, Serge L.: *See*—
Biehler, Jean-Marie J.; Lecolier, Serge L.; and Le Roy, Patrice M., 4,101,472, Cl. 521-85.000.

Lederer, Edgar: *See*—
Adam, Arlette, nee Chosson; LeFrancier, Pierre; and Lederer, Edgar, 4,101,649, Cl. 424-12.000.

Lee, Alan Stuart, to English Electric Company Limited, The. Pipe joints. 4,101,148, Cl. 285-13.000.

LeFrancier, Pierre: *See—*
Adam, Arlette, nee Chosson; LeFrancier, Pierre; and Lederer, Edgar, 4,101,649, Cl. 424-12.000.

Le Goaster, Jacqueline Marie George Juliette. Method and apparatus for transferring microorganisms through the skin barrier. 4,100,920, Cl. 128-172.100.

Lehrer, Erwin: *See—*
Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, 4,100,659, Cl. 28-255.000.

Lehtola, Erkki Topias, to Oy Tahka AB. Arris sprocket chain. 4,100,819, Cl. 74-245.00R.

Lehuen, Christian: *See—*
Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.

Leiber, Heniz, to Robert Bosch GmbH. Apparatus for the testing of a brake system. 4,100,792, Cl. 73-39.000.

Leigh Products, Inc.: *See—*
Antoszewski, Alex Joseph, 4,101,107, Cl. 248-218.400.

Leinfelt, Karl Eric, to Aktiebolaget Electrolux. Vacuum cleaner dust container filling indicator device. 4,100,878, Cl. 116-114.0AD.

LeMay, Christopher Archibald Gordon; and Randall, Robert Paul, to EMI Limited. Radiography. 4,101,773, Cl. 250-401.000.

LeMay, Dan B., to Tylan Corporation. Mass flow sensing system. 4,100,801, Cl. 73-202.000.

Lennington, John W.; and Szeles, Donald M., to Sensors, Inc. Discriminating fire sensor. 4,101,767, Cl. 250-339.000.

Lennon, Donald J. J.: *See—*
Solmon, Donald C.; and Lennon, Donald J. J., 4,101,909, Cl. 346-153.000.

Leonard, Charles Arthur: *See—*
Ward, John Wesley; and Leonard, Charles Arthur, 4,101,662, Cl. 424-267.000.

Leonard, Louis H., to Carrier Corporation. Absorption refrigeration system utilizing solar energy. 4,100,755, Cl. 62-2.000.

Leonardi, Samuel J.: *See—*
Braid, Milton; and Leonardi, Samuel J., 4,101,430, Cl. 252-42.700.

Leroy, Jean Marie Louis: *See—*
Stiot, Jean-Pierre Henri; Brouard, Claude Marie Henri Emile; and Leroy, Jean Marie Louis, 4,101,543, Cl. 260-162.000.

Le Roy, Patrice M.: *See—*
Biehler, Jean-Marie J.; Lecolier, Serge L.; and Le Roy, Patrice M., 4,101,472, Cl. 521-85.000.

Leussink, Reinhard; and Ruf, Walter, to Robert Bosch GmbH. Semiconductor ignition system for internal combustion engines. 4,100,908, Cl. 123-148.00E.

Lever Brothers Company: *See—*
Bhandari, Ashok Kumar; and Kalbag, Shrinath Sheshgiri, 4,101,562, Cl. 260-419.000.

Levine, Isaac Jacob; and Karol, Frederick John, to Union Carbide Corporation. Preparation of modified and activated chromocene catalysts for ethylene polymerization. 4,101,445, Cl. 252-429.00R.

Levitov, Vladimir Ilich; Lyapin, Andrei Grigorievich; and Scherbina, Oleg Vasilievich. High-tension electric cable. 4,101,727, Cl. 174-28.000.

Levy, Mortimer; and Goffe, William L., to Xerox Corporation. Imaging system. 4,101,321, Cl. 96-1.50R.

Lewicki, Edward, to S.L.M. (Model) Engineers Limited. Angular movement resolvers. 4,101,863, Cl. 338-128.000.

Lewis, Bernard L., to United States of America, Navy. Aircraft landing aid for zero-zero visibility landings. 4,101,893, Cl. 343-108.00R.

Leybold-Heraeus GmbH & Co. KG: *See—*
Schunck, Gunter; and Randwo, Albert, 4,101,221, Cl. 356-205.000.

Liakumovich, Alexandr Grigorievich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

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Russer, Peter, 4,101,845, Cl. 331-94.50M.

Lill, Brian Herbert, to EMI Limited. Apparatus for computerized tomography having improved anti-scatter collimators. 4,101,768, Cl. 250-360.000.

Limonta, Marco. Device for cutting velvet bands on lappet looms. 4,100,946, Cl. 139-291.00C.

Lindemann, Martin K.; and Wacome, Donald M., to Chas. S. Tanner Co. Aqueous emulsion copolymers containing lower alkyl hydrogen polysiloxane. 4,101,492, Cl. 260-29.6NR.

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Gallistel, Albert F.; and Lindenfelser, Jerome W., 4,101,913, Cl. 354-122.000.

Lindner, Wolfgang: *See—*
Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, 4,100,660, Cl. 28-271.000.

Lindsley, Warren F. B.: *See—*
Mineck, Fred, 4,100,898, Cl. 123-119.00B.

Lins, Stanley James; Lund, Roger Edward; and Hanson, Marlin Marshall, to Sperry Rand Corporation. Bubble domain propagation using oscillating stripe domains. 4,101,972, Cl. 365-29.000.

Linstromberg, William John; and Rutledge, Charles Thomas, to Whirlpool Corporation. Movable ice receptacle. 4,100,761, Cl. 62-137.000.

Linz, Friedrich; and Sommer, Lothar. Applicator, especially for pigmented liquids. 4,101,225, Cl. 401-119.000.

Litkenhus, John Robert; and Stafford, Donald Wayne, to International Business Machines Corporation. Escapement mechanism for typewriters. 4,101,224, Cl. 400-328.000.

Little, Robert J.: *See—*
Fewkes, Harold L., 4,101,005, Cl. 187-17.000.

Littrell, Thomas D.: *See—*
Timour, Sune E.; and Littrell, Thomas D., 4,101,003, Cl. 184-106.000.

Liu, Chia-Seng: *See—*
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,101,358, Cl. 156-167.000.

Livaditis, Elias J.: *See—*
Clayton, Lorimer, Jr.; and Livaditis, Elias J., 4,101,837, Cl. 325-347.000.

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Janes, Roderick Stewart; and Lloyd, Maurice Edward, 4,100,731, Cl. 60-39.150.

Lloyd, Wayne B., to Westinghouse Electric Corp. Vibration isolation load support apparatus. 4,101,102, Cl. 248-20.000.

Lo, Allen Kwok Wah; and Nims, Jerry Curtis, to Dimensional Development Corporation. Projection apparatus for stereoscopic pictures. 4,101,210, Cl. 353-7.000.

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Kim, Raymond W. H.; Lodge, Edward H.; and Lueders, Arthur L., 4,101,097, Cl. 242-205.000.

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Lomasney, Henry L.; Lomasney, William J.; Metil, Ignatius; and Lagos, Dickens M., to Southern Imperial Coatings Corporation. Method for rapid curing of partially hydrolyzed silicate film. 4,101,692, Cl. 427-333.000.

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Lomasney, Henry L.; Lomasney, William J.; Metil, Ignatius; and Lagos, Dickens M., 4,101,692, Cl. 427-333.000.

Lonchampt, Georges: *See—*
Hilaire, Pierre; and Lonchampt, Georges, 4,101,407, Cl. 204-251.000.

Long, Gary Lynn: *See—*
Bierman, Laurence William; and Long, Gary Lynn, 4,101,637, Cl. 423-309.000.

Longo, John M.: *See—*
Horowitz, Harold S.; and Longo, John M., 4,101,716, Cl. 429-13.000.

Loock, Ehrenfried, to Olympia Werke AG. Aqueous ink for an ink ejection process. 4,101,329, Cl. 106-22.000.

Loper, Carl R., Jr.: *See—*
Rasmussen, Don H.; and Loper, Carl R., Jr., 4,101,310, Cl. 75-0.50B.

L'Oreal: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 4,101,576, Cl. 260-559.00A.

Losee, Michael L.: *See—*
Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., 4,101,485, Cl. 260-29.4UA.

Lotto, Ronald L., to FMC Corporation. Method of making bottom seal thermoplastic bags. 4,101,363, Cl. 156-250.000.

Lovegrove, Brian Walter: *See—*
Hoare, Gordon Harold; and Lovegrove, Brian Walter, 4,101,070, Cl. 233-1.00R.

Lowther, Frank Eugene, to W. R. Grace & Co. Ozone decomposition and electrodesorption process. 4,101,296, Cl. 55-33.000.

Lucas Industries Limited: *See—*
Janes, Roderick Stewart; and Lloyd, Maurice Edward, 4,100,731, Cl. 60-39.150.
Orford, Raymond Leslie; and Smith, Dexter William, 4,101,453, Cl. 252-503.000.
Ryan, Peter; and Bradley, Harry, 4,100,817, Cl. 74-111.000.

Luch, Daniel, to International Nickel Company. Process for making a metal plastic structure. 4,101,385, Cl. 204-20.000.

Lueders, Arthur L.: *See—*
Kim, Raymond W. H.; Lodge, Edward H.; and Lueders, Arthur L., 4,101,097, Cl. 242-205.000.

Luginbuhl, Pierre, to S I G Schweizerische Industrie-Gesellschaft. Apparatus for orienting and sorting elongated articles. 4,101,420, Cl. 209-104.000.

Lumpkin, Robert E., Jr., to Occidental Petroleum Corporation. Method for heating nongaseous carbonaceous material. 4,101,263, Cl. 432-13.000.

Lund, Roger Edward: *See—*
Lins, Stanley James; Lund, Roger Edward; and Hanson, Marlin Marshall, 4,101,972, Cl. 365-29.000.

Lunts, Lawrence Henry Charles: *See—*
Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,101,579, Cl. 260-559.00R.

Lupinski, John H.; and Gorowitz, Bernard, to General Electric Company. Apparatus for electrostatic deposition on a running conductor. 4,100,883, Cl. 118-630.000.

Lurkis, Alexander; and Hill, John I., to Glimmer Security Systems Inc. Photo electric security system. 4,101,876, Cl. 340-555.000.

Lutz, Albert William; and Diehl, Robert Eugene, to American Cyanamid Company. 2,6-Dinitroaniline herbicides. 4,101,582, Cl. 260-574.000.

Luzzi, John J.: *See*—
Ramey, Chester E.; and Luzzi, John J., 4,101,509, Cl. 260-45.75N.
Lyapin, Andrei Grigorievich: *See*—
Levitov, Vladimir Ilich; Lyapin, Andrei Grigorievich; and Scherbina, Oleg Vasilievich, 4,101,727, Cl. 174-28.000.
Lytton, Kenneth G.: *See*—
Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., 4,100,791, Cl. 73-37.700.
M & T Chemicals Inc.: *See*—
Chessin, Hyman; and Seyb, Edgar J., Jr., 4,101,388, Cl. 204-43.00T.
Russo, Robert V., 4,101,471, Cl. 521-121.000.
Sukman, Edwin L., 4,101,655, Cl. 424-204.000.
MacDuff, Richard: *See*—
Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,101,358, Cl. 156-167.000.
MacFadden, Donald L., to Chevron Research Company. Cellulose fermentation process. 4,101,679, Cl. 426-53.000.
MacFarlane, Roger Morton: *See*—
Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, 4,101,976, Cl. 365-119.000.
Machida, Hajime: *See*—
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
Machiguchi, Hiroyuki: *See*—
Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, 4,101,286, Cl. 23-283.000.
Machinefabriek W. Hubert & Co. B.V.: *See*—
Pepping, Roelf, 4,101,400, Cl. 204-180.00R.
Mack, Robert: *See*—
Frost, Francis Edmund; and Mack, Robert, 4,101,054, Cl. 221-278.000.
MacLean, John P.: *See*—
Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., 4,101,288, Cl. 23-288.00B.
MacLeay, Ronald Edward: *See*—
Kamens, Ernest Rudolph; Kressin, Donald Milton; Lange, Harold Carl; and MacLeay, Ronald Edward, 4,101,464, Cl. 521-88.000.
Sheppard, Chester Stephen; and MacLeay, Ronald Edward, 4,101,522, Cl. 528-292.000.
Madden, Thomas Joseph: *See*—
Striebel, Edmund Emil; Koblish, Theodore Richard; Madden, Thomas Joseph; and James, Roger Halsted, 4,100,733, Cl. 60-39.74B.
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, to Hitachi, Ltd. Three phase controlling system. 4,101,819, Cl. 323-24.000.
Maeda, Yutaka; and Kawabe, Mitsuhiro, to Okuma Machinery Works Ltd. Position-correctable numerical control system. 4,101,817, Cl. 318-603.000.
Magee, John E. Control system for limiting elevator car movement speed unless car doors are fully closed. 4,101,007, Cl. 187-29.00R.
Magel, Bernard, to Du Pont de Nemours, E. I., and Company. Yarn having alternating entangled and unentangled lengths. 4,100,725, Cl. 57-140.00J.
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Novel lysergic acid amides and process for preparing same. 4,101,552, Cl. 260-285.500.
Magrone, Robert: *See*—
Mercier, Henri; Magrone, Robert; and Deabriges, Jean, 4,101,629, Cl. 423-121.000.
Maguire, Edward John, Jr.: *See*—
Place, Geoffrey; and Maguire, Edward John, Jr., 4,101,457, Cl. 252-559.000.
Maher, Joseph M.: *See*—
Mattila, Eugene W.; and Maher, Joseph M., 4,101,141, Cl. 279-19.000.
Mahnke, Parker E. Pull type exercising apparatus. 4,101,124, Cl. 272-134.000.
Maier, Johann, to BHS-Bayerische Berg-,Hutten-und Salzerke Aktiengesellschaft. Single face corrugating machine. 4,101,367, Cl. 156-471.000.
Maitani, Yoshihisa; and Kidawara, Atsushi, to Olympus Optical Co., Ltd. Exposure indicator for camera having electrical shutter. 4,101,911, Cl. 354-53.000.
Major, Burney A.: *See*—
Urbanic, John M.; and Major, Burney A., 4,101,751, Cl. 219-74.000.
Maletin, Alexei Mikhailovich, deceased: *See*—
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Maletin, Ljubov Alexeevna, administrator: *See*—
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Maletina, Tatyana Alexeevna, administrator: *See*—
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Malinowski, William J., to Chloride, Incorporated. Smoke detector with switch means for increasing the sensitivity. 4,101,785, Cl. 250-574.000.
Malkani, Chandler: *See*—
Sellers, Edward C.; and Malkani, Chandler, 4,101,320, Cl. 96-1.400.
Mallory, James D., to Owens-Illinois, Inc. Valve block. 4,100,937, Cl. 137-596.160.
Malmstrom, Karl Gunnar; and Mattsson, Karl Lennart. Improvments in or relating to boilers. 4,100,887, Cl. 122-379.000.
Malone, Hugh Robert, to Motorola, Inc. Oscillator apparatus adapted to lock onto a single pulse of radio frequency waves. 4,101,844, Cl. 331-10.000.
Malpass, Dennis B.; and Watson, Spencer C., to Texas Alkyls, Inc. Production of dialkylaluminum hydrides. 4,101,568, Cl. 260-448.00A.
Maly, George P.; and Young, Donald C., to Union Oil Company of California. Acid composition and method for acid treating geological formations. 4,101,426, Cl. 252-8.55C.
Maly, George P.: *See*—
Young, Donald C.; and Maly, George P., 4,101,425, Cl. 252-8.55C.
Mammino, Joseph: *See*—
Weigl, John Wolfgang; and Mammino, Joseph, 4,101,904, Cl. 346-74.100.
Manchanda, Krishan Dayal: *See*—
Ambrosini, Ronald Frank; Anderson, Richard Alan; Fornoff, Louis Leonard; and Manchanda, Krishan Dayal, 4,101,631, Cl. 423-210.000.
Mannesmann Aktiengesellschaft: *See*—
Dorp, Walter Vom; Ritter, Hans Georg; and Witteck, Fritz, 4,100,786, Cl. 72-252.000.
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.
Mannsdoerfer, Walter: *See*—
Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, 4,101,008, Cl. 188-1.00B.
Mansfield, Brian A.; and Watkins, Royston K., to U.S. Philips Corporation. Image intensifier T. V. fluoroscopy system. 4,101,776, Cl. 250-416.0TV.
Mansol Ceramics Company: *See*—
Landsittel, David Thomas, 4,100,675, Cl. 29-627.000.
Manufacturas Vega S.A.: *See*—
Urdanoz, Luis Vega, 4,101,164, Cl. 297-159.000.
Marancik, William G., to Airco, Inc. Composite multifilament superconductors. 4,101,731, Cl. 174-126.00S.
Marchand, Jean, to BFG Glassgroup. Method and apparatus for feeding glass out of a melting tank to a flat glass forming means. 4,101,304, Cl. 65-135.000.
Marconi Company Limited, The: *See*—
Quilliam, Robert Mark, 4,101,935, Cl. 358-293.000.
Marcus, Sanford Morton, to Du Pont de Nemours, E. I., and Company. Silver compositions. 4,101,710, Cl. 428-472.000.
Marietta Concrete Company: *See*—
Sheng, Sheng P., 4,100,654, Cl. 24-20.00R.
Marion, Frank A., to Universal Propulsion Company, Inc. Oxygen gas generator and method of manufacturing the gas generator. 4,101,291, Cl. 44-17.000.
Marker, Hannes: *See*—
Korger, Heinz, 4,101,145, Cl. 280-605.000.
Marnay, Louis: *See*—
Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.
Marquet, Andre: *See*—
Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.
Marquez, Manuel J., to Raymond Lee Organization, Inc., The. Ladder step. 4,100,998, Cl. 182-116.000.
Marsai, Maria: *See*—
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.
Marschke, Jon V., to SURELAB Superior Research Laboratories, Inc. Rotary tool for driving English and metric threaded members. 4,100,824, Cl. 81-121.00R.
Marshall, Dan H., II: *See*—
Warner, Melvin B. "Cy"; and Marshall, Dan H., II, 4,101,894, Cl. 343-112.00R.
Marshall, Margaret V.: *See*—
Marshall, Richard M.; and Marshall, Margaret V., 4,100,956, Cl. 152-427.000.
Marshall, Richard M.; and Marshall, Margaret V. Tire inflation coupling apparatus. 4,100,956, Cl. 152-427.000.
Martel, Jacques; Huynh, Chanh; and Buendia, Jean, to Roussel Uclaf. Cyclopropanecarboxylic acid chlorides. 4,101,574, Cl. 260-544.00L.
Martin, Bernard L.; and Vogel, Bruce N., to Carpenter Rigging and Supply Company, Inc. Cable pulling system. 4,101,114, Cl. 254-134.3FT.
Martin, Julian Richard: *See*—
Baker, Max Norris; and Martin, Julian Richard, 4,101,362, Cl. 156-235.000.
Martin, Lincoln A., to Geophysical Systems Corporation. Method of determining weathering corrections in seismic operations. 4,101,867, Cl. 340-15.5TC.
Martin, Wolfgang: *See*—
Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, 4,100,659, Cl. 28-255.000.

Martines, Vincent C., to Stauffer Chemical Company. Use of phosphorus derivatives as stabilizing agents for perchloromethyl mercaptan. 4,101,572, Cl. 260-543.00H.

Martino, Joseph F.: *See—*
King, Gerard J.; and Martino, Joseph F., 4,100,672, Cl. 29-577.00C.

Martinsons, Aleksandrs: *See—*
Johnson, Harlan B.; Martinsons, Aleksandrs; and Welch, Cletus N., 4,101,624, Cl. 264-273.000.

Marulic, Walter J.: *See—*
Gutridge, Jack E.; and Marulic, Walter J., 4,100,857, Cl. 105-323.000.

Maruyama, Takeshi: *See—*
Shimizu, Keizo; Maruyama, Takeshi; and Fujimura, Toshio, 4,101,878, Cl. 340-310.00R.

Maruzen Oil Co., Ltd.: *See—*
Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.

Marvin Glass & Associates: *See—*
Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., 4,101,619, Cl. 264-156.000.

Maslov, Vadim Nikolaevich: *See—*
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Massachusetts Institute of Technology: *See—*
Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., 4,101,965, Cl. 364-821.000.

Massey, Robert G.: *See—*
Possley, Glen G.; Massey, Robert G.; and Williams, Billy B., 4,101,350, Cl. 148-175.000.

Masson, John Richard; and Dooley, Joseph, to Golden Wonder Limited. Extrusion process for the treatment of cereals. 4,101,684, Cl. 426-625.000.

Mast, John George, Jr., to Procter & Gamble Company, The. Disposable product applicator and dispensing package therefor. 4,101,053, Cl. 221-232.000.

Mathai, John: *See—*
Cunningham, Arthur L.; and Mathai, John, 4,101,527, Cl. 528-73.000.

Matheson, Stuart C. Apparatus for removing ice and sleet from a third rail of an electrified railway vehicle. 4,101,014, Cl. 191-62.000.

Mathisen, Einar Skau, to International Business Machines Corporation. Spectrophotometer sample holder with improved sample viewing apparatus. 4,101,222, Cl. 356-244.000.

Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, to Sumitomo Chemical Company, Limited. Disperse dyeing with polyglycerine anionic emulsifiers and/or polyaryl polyglycol ethers. 4,101,273, Cl. 8-172.00R.

Matsuda, Hitoshi: *See—*
Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, 4,101,133, Cl. 274-23.00R.

Matsukawa, Hiroharu: *See—*
Miyamoto, Akio; and Matsukawa, Hiroharu, 4,101,690, Cl. 427-150.000.

Matsumoto, Kohji: *See—*
Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.

Matsumoto, Ryutaro: *See—*
Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, 4,101,275, Cl. 23-230.00R.

Matsuno, Yoshiyuki; Kobayashi, Hiroshi; and Watanabe, Ryo, to Mitsubishi Jukogyo Kabushiki Kaisha. Slurry vessel. 4,100,872, Cl. 114-73.000.

Matsushita Electric Industrial Company: *See—*
Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, 4,101,795, Cl. 310-336.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Konishi, Fumiya; Kusao, Kenji; and Yoshioka, Yoshiaki, 4,101,772, Cl. 250-399.000.

Matsushita, Shuzo: *See—*
Ueda, Hiroshi; and Matsushita, Shuzo, 4,101,917, Cl. 354-273.000.

Mattel, Inc.: *See—*
Bass, Sidney; and Rich, Hubert Allen, 4,100,867, Cl. 112-270.000.
Shih-Teng Chang, Richard; and Landsinger, Edmund Emil, 4,100,728, Cl. 58-74.000.

Matthaei, Horst: *See—*
Hehl, Walter; and Matthaei, Horst, 4,101,009, Cl. 188-1.00B.

Matthews, Richard A.: *See—*
Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., 4,101,959, Cl. 364-200.000.

Mattila, Eugene W.; and Maher, Joseph M., to Copper Range Company. Drive chuck. 4,101,141, Cl. 279-19.000.

Mattimoe, George E.; and Gouveia, Michael P., to Mattimoe, George E. Temperature-compensating petroleum product dispensing unit. 4,101,056, Cl. 222-26.000.

Mattsson, Karl Lennart: *See—*
Malmstrom, Karl Gunnar; and Mattsson, Karl Lennart, 4,100,887, Cl. 122-379.000.

Matuska, Jan: *See—*
Resch, Josef; Matuska, Jan; and Trejtnar, Jindrich, 4,100,945, Cl. 139-291.00C.

Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, to Becton, Dickinson and Company. Prefillable, hermetically sealed container adapted for use with a humidifier or nebulizer head. 4,101,041, Cl. 215-6.000.

Maxwell, Ronald K.: *See—*
Bingham, John A. C.; and Maxwell, Ronald K., 4,101,833, Cl. 325-30.000.

May, Erhard T. Apparatus for the treatment of thread and the like. 4,100,880, Cl. 118-234.000.

Mayama, Takeshi: *See—*
Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.

Mayer, Albert L.: *See—*
Gottschalk, Robert E.; and Mayer, Albert L., 4,101,916, Cl. 354-219.000.

Mayer, Edward A., to Texaco Inc. Vacuum assist fuel system. 4,100,758, Cl. 62-54.000.

Mayer, Hermann, to Robert Bosch GmbH. Automatic diaphragm control system means for preventing energization of the diaphragm adjusting mechanism when the adjusting mechanism is at the limit of its adjusting range. 4,101,910, Cl. 354-42.000.

Mayer, Rolf; and Speckhart, Max, to Bosch-Siemens Hausgerate GmbH. Electric motor-driven coffee mill. 4,101,082, Cl. 241-282.100.

Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of 4,4'-dinitrodiphenyl carbonate. 4,101,569, Cl. 260-463.000.

MBI, Inc.: *See—*
Schiffman, Murray M., 4,101,373, Cl. 156-659.000.

McCarter, Ed R.: *See—*
Thatcher, Arthur K.; and McCarter, Ed R., 4,100,896, Cl. 123-119.0EE.

McClure, Lester Dennis: *See—*
Ranus, Walter J., Jr.; and McClure, Lester Dennis, 4,101,584, Cl. 260-590.00D.

McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, to Wickman Machine Tool Sales Limited. Controls for multi spindle lathes. 4,100,825, Cl. 82-3.000.

McConnell, Kennedy, to Interlake, Inc. Panel mounting clip for storage rack. 4,101,233, Cl. 403-397.000.

McEntire, Edward E., to Texaco Development Corp. Bis (dimethylaminopropyl)-amine derivatives as polyurethane catalysts. 4,101,466, Cl. 521-115.000.

McEntire, Edward E., to Texaco Development Corp. Urethane catalysts. 4,101,470, Cl. 521-118.000.

McFadden, Arthur Raymond; and Aultz, Daniel Eugene, to American Hoechst Corporation. Precursors of heterofuranobenzoxepin acetic acids. 4,101,559, Cl. 260-347.300.

McGraw-Edison Company: *See—*
Fister, Aloysius J., 4,101,860, Cl. 337-159.000.

McGraw, John D.: *See—*
Gorchev, Dimiter; and McGraw, John D., 4,100,964, Cl. 165-40.000.

McGreivy, Denis J.: *See—*
Roesner, Bruce B.; and McGreivy, Denis J., 4,101,349, Cl. 148-175.000.

McGuirk, Francis A., Jr.: *See—*
Atkins, Carl E.; and McGuirk, Francis A., Jr., 4,101,791, Cl. 307-308.000.

McIntyre, Louise Creegan: *See—*
Anderson, Benjamin Ernest; and McIntyre, Louise Creegan, 4,101,873, Cl. 340-539.000.

McKay, Michael Lance: *See—*
Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, 4,101,455, Cl. 252-531.000.

McLaren, James: *See—*
Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, 4,101,413, Cl. 208-8.000.

McLaughlin, Alexander: *See—*
Lockwood, Robert J.; McLaughlin, Alexander; and Reymore, Harold E., Jr., 4,101,465, Cl. 521-118.000.

McManus, Francis C. A. Modular office furniture. 4,101,183, Cl. 312-195.000.

McNair, Samuel L.: *See—*
Talge, Henry J.; McNair, Samuel L.; and Zugenbuhler, Verne L., 4,100,917, Cl. 128-66.000.

McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce, 4,101,659, Cl. 424-248.560.

McQuaid, Phillip T.: *See—*
Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., 4,101,132, Cl. 273-29.00A.

Mead Corporation, The: *See—*
Wood, Prentice J., 4,101,069, Cl. 229-40.000.

Meb, Inc.: *See—*
Vail, Ande R., 4,101,787, Cl. 307-81.000.

Mecone, David W.: *See—*
Shaffer, John W.; Mecone, David W.; and Colville, William T., 4,101,259, Cl. 431-93.000.

Medical Engineering Corp.: *See—*
Cromie, Harry W., 4,101,031, Cl. 206-438.000.

Meier, Eugen, to Mettler Instrumente Ag. Vibration-resistant balance. 4,100,985, Cl. 177-189.000.

Meiji Seika Kaisha, Ltd.: *See—*
Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.

Meiners, Hans-Joachim: *See—*
Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, 4,101,468, Cl. 521-115.000.

Meinzer, Lester N. Crash cushion. 4,101,115, Cl. 256-13.100.
Meito Sangyo Kabushiki Kaisha: *See—*
Hasegawa, Masakatsu; and Hokkoku, Syusaburo, 4,101,435, Cl. 252-62.530.
Meixner, Edwin Joseph, to Borg-Warner Corporation. System for measuring torque and speed of rotating shaft. 4,100,794, Cl. 73-136.00A.
Melander, Robert A.: *See—*
Doss, Daniel L.; and Melander, Robert A., 4,101,822, Cl. 324-16.00R.
Melville, Andreas T.: *See—*
Blumenthal, Robert N.; and Melville, Andreas T., 4,101,404, Cl. 204-195.00S.
Menier, Vincent J., to North American Systems, Inc. Method of forming paper products. 4,101,627, Cl. 264-323.000.
Mercaldi, William Burrows: *See—*
Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, 4,100,864, Cl. 112-121.110.
Mercet, Gerard: *See—*
Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.
Mercier, Henri; Magrone, Robert; and Deabriges, Jean, to Aluminium Pechiney. Purification of solutions circulating in the bayer cycle. 4,101,629, Cl. 423-121.000.
Merle, Jean Pierre: *See—*
Branlard, Paul; and Merle, Jean Pierre, 4,101,481, Cl. 260-23.70A.
Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., to Millipore Corporation. Tubular filtration element and method of making it. 4,101,423, Cl. 210-494.00M.
Merryman, Wayne R., to Pacific Western Systems. Timing pulse generator. 4,101,761, Cl. 235-92.0CA.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Hofmann, Heinrich, 4,100,836, Cl. 89-7.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 4,101,376, Cl. 176-39.000.
Metil, Ignatius: *See—*
Lomasney, Henry L.; Lomasney, William J.; Metil, Ignatius; and Lagos, Dickens M., 4,101,692, Cl. 427-333.000.
Metso, Pertti Lauri, to A. Ahlstrom Osakeyhtio. Controlled deflection roll. 4,100,662, Cl. 29-110.000.
Mettler Instrumente Ag: *See—*
Meier, Eugen, 4,100,985, Cl. 177-189.000.
Metz Apparatewerke: *See—*
Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, 4,101,812, Cl. 315-241.00P.
Meyer, Jack M., to Neenah Foundry Company. Sealing manhole cover for use on existing unsealed sanitary sewer manhole cover frames. 4,101,236, Cl. 404-25.000.
Meyer, Jeffry R.; and Hess, Robert L., to Westinghouse Electric Corp. Modular puffer-type circuit-interrupter unit adaptable for different voltage and current ratings. 4,101,748, Cl. 200-148.00A.
Meyer, Yves: *See—*
Carre, Jean-Jacques; and Meyer, Yves, 4,101,176, Cl. 303-6.00C.
Meyers, Earl, to Clemmer Industries (1964) Limited. Bushing. 4,100,645, Cl. 16-2.000.
Meynig, Robert E. Time cycle actuator. 4,100,939, Cl. 137-627.500.
Michels, Albertus Peter Johannes, to U.S. Philips Corporation. Hot-gas engine. 4,100,741, Cl. 60-517.000.
Midland Designing & Manufacturing Co. Ltd., The: *See—*
Page, Roy Arthur, 4,101,368, Cl. 156-503.000.
Midwinter, John Edwin; and Day, Clive Richard, to Post Office, The. Drawing dielectric optical waveguides. 4,101,305, Cl. 65-145.000.
Mikes, Otakar: *See—*
Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.
Mikhailov, Gennady Grigorievich: *See—*
Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich, 4,100,708, Cl. 52-222.000.
Miles, Barry Donald Ruberry: *See—*
Owen, David Peter; and Miles, Barry Donald Ruberry, 4,101,939, Cl. 360-36.000.
Miller, Edward G., Jr.: *See—*
Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, 4,100,955, Cl. 152-362.0CS.
Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., to Fiber Controls Corporation. Auto-leveler. 4,100,791, Cl. 73-37.700.
Miller, Irving L.: *See—*
Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 4,101,383, Cl. 195-103.50R.
Miller, Joe A., to Baxter Travenol Laboratories, Inc. Flexible collapsible container defining relatively rigid shoulder and base at opposite ends. 4,100,953, Cl. 150-0.500.
Miller, John E.; and Postema, James R., to Universal Electric Company. Motor seals. 4,101,794, Cl. 310-71.000.
Miller, John W. V.: *See—*
Schermerhorn, Jerry D.; and Miller, John W. V., 4,101,810, Cl. 315-169.0TV.
Miller, Scott William: *See—*
Van Dyck, Kenneth Arthur; Wyatt, James Bartlett; Stephenson, Charles Francis; and Miller, Scott William, 4,101,757, Cl. 219-225.000.
Miller, Thomas R., to Continental Oil Company. Slurry control system. 4,101,174, Cl. 302-11.000.
Millhollan, Michael S.: *See—*
Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., 4,101,974, Cl. 365-96.000.
Milliken Research Corporation: *See—*
Shortte, Willard Harmond, Jr., 4,100,863, Cl. 112-79.00R.
Millipore Corporation: *See—*
Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., 4,101,423, Cl. 210-494.00M.
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Argus Chemical Corporation. 2,2,6,6-Tetramethyl-4-piperidyl bicyclic heptane and octane carboxylic acid esters as stabilizers for synthetic polymers. 4,101,508, Cl. 260-45.80N.
Minami, Hiroshi; Harao, Norio; and Tsuneoka, Takuji, to Tokyo Shibaura Electric Co., Ltd. X-ray image intensifier photofluorography apparatus for correcting the brightness of the output image. 4,101,766, Cl. 250-320.000.
Minard, Marguerite F., to Raymond Lee Organization, Inc., The. Utility knob. 4,101,104, Cl. 248-95.000.
Mineck, Fred, to Archer, Dorothy J.; Mineck, Jay A.; and Lindsley, Warren F. B., part interest to each. Combination crankcase ventilation valve and supplementary carburetor. 4,100,898, Cl. 123-119.00B.
Mineck, Jay A.: *See—*
Mineck, Fred, 4,100,898, Cl. 123-119.00B.
Minjolle, Louis: *See—*
d'Andrea, Felix; and Minjolle, Louis, 4,100,881, Cl. 118-319.000.
Minks, Floyd A.: *See—*
Minks, Floyd M.; and Minks, Floyd A., 4,100,906, Cl. 123-148.00E.
Minks, Floyd M.; and Minks, Floyd A. Pulse generator for energy discharge system. 4,100,906, Cl. 123-148.00E.
Minnesota Mining and Manufacturing Company: *See—*
Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., 4,101,513, Cl. 526-193.000.
Thom, Karl Friedrich, 4,101,514, Cl. 528-109.000.
Tung, Chi Fang, 4,100,625, Cl. 2-410.000.
Minolla, Horst, to Klippan GmbH Hamburg. Detent action buckle. 4,100,657, Cl. 24-230.0AL.
Minolta Camera Kabushiki Kaisha: *See—*
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
Mutsushita, Shuzo, 4,101,223, Cl. 354-286.000.
Ohneda, Shoichi; and Okano, Yukio, 4,101,929, Cl. 358-44.000.
Ueda, Hiroshi; and Matsushita, Shuzo, 4,101,917, Cl. 354-273.000.
Yamaguchi, Tamikazu, 4,101,203, Cl. 350-217.000.
Yamashita, Maki; and Kogure, Yasuzi, 4,101,914, Cl. 354-128.000.
Misawa, Norio: *See—*
Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.
Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, to Sandoz Ltd. 1,4-Diaminoanthraquinones. 4,101,547, Cl. 544-294.000.
Mistral Windsurfing AG: *See—*
Prade, Ernstfried, 4,100,870, Cl. 114-39.000.
Mitchell, Bruce Richard; and Swift, Harold Eugene, to Gulf Research & Development Company. Method of negating the effects of metals poisoning on zeolitic cracking catalysts. 4,101,417, Cl. 208-120.000.
Mitchell, Kenneth M.; and Wise, John J., to Mobil Oil Company. Low pressure xylene isomerization. 4,101,596, Cl. 260-668.00A.
Mitchell, Michael W.; and Hauser, James C. Water bed construction. 4,100,635, Cl. 5-368.000.
Mitco Corporation: *See—*
Gorchev, Dimiter; and McGraw, John D., 4,100,964, Cl. 165-40.000.
Mitsubishi Chemical Industries Limited: *See—*
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Matsuno, Yoshiyuki; Kobayashi, Hiroshi; and Watanabe, Ryo, 4,100,872, Cl. 114-73.000.
Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.
Mitsui, Nobuo: *See—*
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
Miura, Chiaki: *See—*
Kamada, Hidemoto; Miura, Chiaki; and Utena, Makoto, 4,101,683, Cl. 426-618.000.
Miwa, Naoki: *See—*
Ishizuka, Takashi; and Miwa, Naoki, 4,101,488, Cl. 260-29.20N.
Mixan, Craig E.; and Goralski, Christian T., to Dow Chemical Company, The. Cyanatothiomethylthio pyrazines. 4,101,546, Cl. 544-408.000.
Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air control system in an internal combustion engine. 4,100,735, Cl. 60-276.000.
Miyamoto, Akio; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Desensitizing composition. 4,101,690, Cl. 427-150.000.

Miyazaki, Kensaku; and Shinohara, Toshio, to Olympus Optical Co., Ltd. Screen microscope with variable illumination. 4,101,194, Cl. 350-9.000.

Miyazaki, Sadao: *See*—
Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.

Miyazaki, Yasushi: *See*—
Kaneko, Hideaki; Miyazaki, Yasushi; and Suzuki, Masanori, 4,101,339, Cl. 134-2.000.

Mizuho Ika Kogyo Kabushiki Kaisha: *See*—
Seshima, Kensuke, 4,101,120, Cl. 269-323.000.

Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Printing plate and method for forming the same having small projections in non-image areas. 4,101,324, Cl. 96-36.300.

Mizuno, Yukio, to Nissan Motor Company, Limited. Apparatus for selectively inserting weft yarns into the shed in a weaving loom. 4,100,947, Cl. 139-453.000.

Mobil Oil Company: *See*—
Mitchell, Kenneth M.; and Wise, John J., 4,101,596, Cl. 260-668.00A.

Mobil Oil Corporation: *See*—
Braid, Milton; and Leonardi, Samuel J., 4,101,430, Cl. 252-42.700.
Breckenridge, Lloyd L., 4,101,597, Cl. 260-668.00A.
Chen, Nai Y.; and Reagan, William J., 4,101,595, Cl. 260-668.00A.
Okorodudu, Abraham O. M., 4,101,432, Cl. 252-49.800.
Ruehle, William H., 4,101,866, Cl. 340-7.00R.

Mochizuki, Hidenobu: *See*—
Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.

Mochizuki, Hiroshi: *See*—
Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.

Mochizuki, Nobuo; and Demizu, Hiromi, to Ricoh Company, Ltd. Rubber developer roller using single component toner. 4,100,884, Cl. 118-653.000.

Model, Hans-Jurgen: *See*—
Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.

Modulus Corporation: *See*—
Payne, William J., 4,100,666, Cl. 29-407.000.

Moe, Per H. Joint for trusses. 4,101,230, Cl. 403-171.000.

Moedritzer, Kurt, to Monsanto Company. Method for the manufacture of organo substituted phosphonium salts. 4,101,587, Cl. 260-606.50F.

Moeller, Werner: *See*—
Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., 4,100,796, Cl. 73-160.000.

Moertel, George B., to Textron Inc. Slide fastener stringer and method of manufacture. 4,100,656, Cl. 24-205.16C.

Mogilevsky, Israel. Dental articulator. 4,100,679, Cl. 32-32.000.

Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,100,852, Cl. 101-295.000.

Monroe, Joseph C.: *See*—
Adams, Steven M.; and Monroe, Joseph C., 4,101,178, Cl. 308-3.600.

Monroe, Lawrence S., to Textron Inc. Method and apparatus for folding and fusing the elements of a slide fastener string. 4,101,360, Cl. 156-200.000.

Monsanto Company: *See*—
Barker, Robert I.; and King, David P., 4,101,612, Cl. 264-22.000.
Brodsky, Philip H., 4,101,500, Cl. 260-38.000.
Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., 4,101,485, Cl. 260-29.4UA.
Churchill, Geoffrey B.; and White, J. Craig, 4,101,702, Cl. 428-213.000.
Hallcher, Richard C., 4,101,391, Cl. 204-59.00R.
Hallcher, Richard C.; and Baizer, Manuel M., 4,101,392, Cl. 204-59.00R.
Johnson, Joseph E., Jr.; and Warrell, Richard D., 4,101,043, Cl. 215-100.00R.
Moedritzer, Kurt, 4,101,587, Cl. 260-606.50F.
Ort, Morris R., 4,101,517, Cl. 528-271.000.

Montanari, Piero, to WABCO Westinghouse. Fail-safe resistor. 4,101,820, Cl. 323-94.00R.

Monti, Anthony: *See*—
Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.

Mooney, Thomas; and Shemtov, Sami, to I.T.E. Imperial Corporation. Cradle type conduit hangers. 4,101,103, Cl. 248-58.000.

Moore, Ernest George: *See*—
Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 4,100,719, Cl. 53-241.000.

Morais, Don, to General Electric Company. Discharge lamp operating circuit. 4,101,809, Cl. 315-156.000.

Morgan, Donald F.; and Wolosky, Irwin S., to Amerace Corporation. Molded composition and article molded therefrom. 4,101,463, Cl. 260-2.300.

Mori, Koichi, to Diesel Kiki Co., Ltd. Mechanical governor for internal combustion engine. 4,100,890, Cl. 123-140.00R.

Mori, Mamoru; and Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt device for use in vehicle. 4,101,170, Cl. 297-389.000.

Morin, Robert J. Collapsible chair. 4,101,163, Cl. 297-16.000.

Morini, Rino. Blanking and forming press for sheet metal caps. 4,100,788, Cl. 72-329.000.

Morishita, Hazime: *See*—
Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.

Moroz, Raymond D.: *See*—
Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.

Morris, Arthur E., to University of Missouri, The Curators of the. Process for recovery of lead from lead sulfide concentrates. 4,101,314, Cl. 75-77.000.

Morris, Ronald E.: *See*—
Fewkes, Harold L., 4,101,005, Cl. 187-17.000.

Morrison, Gary Eugene, to Goldesberry, John M., a part interest. C.B. radio antenna unit system and process. 4,101,897, Cl. 343-715.000.

Morrisroe, John J.; and Banigan, Thomas F., to Pilot Chemical Company. 1,3,4 Triols and derivatives thereof. 4,101,589, Cl. 260-615.00B.

Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, to AMP Incorporated. Discrete wire interconnections for connector blocks. 4,101,189, Cl. 339-99.00R.

Moskal, John J., to Premier Industrial Corporation. Non-aqueous water-displacing sealant composition for vehicle glass joints. 4,101,483, Cl. 260-27.0BB.

MOTAN Gesellschaft mit beschrankter Haftung: *See*—
Haag, Franz; and Bongartz, Paul, 4,101,116, Cl. 366-142.000.

Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, to Tokuyama Soda Kabushiki Kaisha. Cathode-structure for electrolysis. 4,101,395, Cl. 204-98.000.

Motorola, Inc.: *See*—
Craig, Timothy Philip; and Stimple, James Roy, 4,101,836, Cl. 325-302.000.
Davis, William F.; and Pace, Wilson David, 4,100,907, Cl. 123-148.00S.
Dworsky, Lawrence Noah; and Whalin, Jeffery Alden, 4,101,850, Cl. 333-24.200.
Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., 4,101,974, Cl. 365-96.000.
Kommrusch, Richard Stephen, 4,101,901, Cl. 343-853.000.
Malone, Hugh Robert, 4,101,844, Cl. 331-10.000.

Mott, George E.; and Seguin, Ronald D., to Texaco Inc. Marine structure with riser conductor and pipeline connection. 4,100,753, Cl. 61-86.000.

Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., to Stone & Webster Engineering Corporation. Impact energy absorbing pipe restraints. 4,101,118, Cl. 267-136.000.

Mounts, William T.; and Stratton, Joseph B., to Caterpillar Tractor Co. Semi-modular cab joint line sealing arrangement. 4,101,160, Cl. 296-35.00R.

Mowen, Robert P.; and Gettings, Jacob D. 4-Row trac planter. 4,100,862, Cl. 111-52.000.

MSI Electronics Inc.: *See*—
Greig, John H., 4,101,830, Cl. 324-158.00F.

Mueller, Horst, to Siemens Aktiengesellschaft. Demultiplexer for originally synchronous digital signals internested word-wise. 4,101,739, Cl. 179-15.00A.

Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., to Xerox Corporation. Roll fuser cleaning system. 4,101,267, Cl. 432-60.000.

Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., to Exxon Research & Engineering Co. Selective synthesis of 2-haloalkanethiols and episulfides therefrom. 4,101,557, Cl. 260-327.00E.

Muijs, Cornelis G. M.: *See*—
Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 4,100,720, Cl. 56-14.600.

Muller, Dieter; Endlich, Wilhelm; and Kugler, Siegfried. Dowel or anchoring means. 4,100,954, Cl. 151-41.700.

Muller, Gerhard: *See*—
Kotzsch, Hans-Joachim; Muller, Gerhard; and Vahlensieck, Hans-Joachim, 4,101,397, Cl. 204-158.0HA.

Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, to Metz Apparatewerke. Photographic flash unit. 4,101,812, Cl. 315-241.00P.

Muraishi, Masakazu; and Sekino, Takao, to Nissan Motor Company, Limited. Adjustable seat for a motor vehicle. 4,101,169, Cl. 297-341.000.

Murakami, Masayuki: *See*—
Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.

Murakami, Tadayoshi: *See*—
Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.

Murano, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Air-conditioning apparatus. 4,100,764, Cl. 62-289.000.

Murata Manufacturing Co., Ltd.: *See*—
Kuze, Saburo, 4,101,951, Cl. 361-293.000.

Murata, Tomoji: *See*—
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.

Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., to Allied Chemical Corporation. Constant boiling mixtures of 1-chloro-2,2,2-trifluoroethane and hydrocarbons. 4,101,436, Cl. 252-67.000.

Muschelknautz, Edgar: *See*—
Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, 4,100,660, Cl. 28-271.000.

Musgrave, Daniel Dennis. Ready magazine holder. 4,100,694, Cl. 42-90.000.

Muto, Masaaki: *See—*
Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, 4,101,361, Cl. 156-250.000.
Mutsushita, Shuzo, to Minolta Camera Kabushiki Kaisha. Attachment member for exchangeable lenses. 4,101,223, Cl. 354-286.000.
Myers, William Perry; and Torzala, Terence August, to Bendix Corporation, The. Pressure cycling control for fluid separator mechanism. 4,101,298, Cl. 55-163.000.
Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, to Dowa Mining Co., Ltd. Bubble forming device having no moving parts. 4,101,286, Cl. 23-283.000.
Nagasawa, Hiroyuki; and Kaneko, Kunio, to Sony Corporation. Green light emitting diode. 4,101,920, Cl. 357-17.000.
Nagasawa, Michitaro: *See—*
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
Nakabayashi Kabushiki Kaisha: *See—*
Takimoto, Yasukatsu, 4,100,640, Cl. 11-1.00R.
Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, to Toagosei Chemical Industry Co., Ltd. Crosslinking emulsion. 4,101,493, Cl. 260-29.60R.
Nakahara, Takuo: *See—*
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.
Nakai, Kouji: *See—*
Nakano, Keiichi; and Nakai, Kouji, 4,100,909, Cl. 123-196.0AB.
Nakajima, Sataro: *See—*
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Takagi, Yasuo, to Nissan Motor Company, Limited. Spark-ignition internal combustion engine equipped with exhaust gas recirculation system. 4,100,736, Cl. 60-278.000.
Nakanishi, Keiichi, to Nissan Motor Company, Limited. Bearing structure for a rotary disc. 4,101,181, Cl. 308-36.000.
Nakano, Keiichi; and Nakai, Kouji, to Kubota, Ltd. Lubrication system for air-cooled engines. 4,100,909, Cl. 123-196.0AB.
Nakayama, Shozo; Kurahashi, Masayuki; and Hattori, Mitsuhiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor. 4,101,249, Cl. 417-269.000.
Nakayama, Shozo; Kurahashi, Masayuki; and Araki, Nobuyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor. 4,101,250, Cl. 417-269.000.
Nalamwar, Ashok L.: *See—*
Epstein, Max; and Nalamwar, Ashok L., 4,101,852, Cl. 333-30.00R.
Nambu, Masao; Yamamoto, Syunichi; and Koiwai, Yoshihisa, to Nippon Oil Company Ltd. Method for regenerating and recycling catalyst for oxidation of sulfur dioxide. 4,101,635, Cl. 423-242.000.
Napor, Carl A.; Krumm, Charles G.; and Kucich, Joseph, to Kahle Engineering Co. Method and means for loading film cartridges. 4,100,667, Cl. 29-429.000.
Napp Chemicals Inc.: *See—*
Ranus, Walter J., Jr.; and McClure, Lester Dennis, 4,101,584, Cl. 260-590.00D.
National Gypsum Company: *See—*
Stiling, Rodney A., 4,101,630, Cl. 423-171.000.
National Research Development Corporation: *See—*
Hiles, Maurice Arthur Frederick, 4,101,704, Cl. 428-218.000.
Wray, Gordon Richard; and Parry, Ruth Mary, 4,100,814, Cl. 74-43.000.
Naviello, Gerard P.: *See—*
Khattab, Ghazi; and Naviello, Gerard P., 4,101,502, Cl. 260-40.00R.
NCR Corporation: *See—*
Hale, William J.; Horst, William R.; and Walker, Donald A., 4,101,905, Cl. 346-74.100.
Smith, Gerald P., 4,101,745, Cl. 200-61.610.
Neal, Peter Frederick: *See—*
Coplin, John Frederick; Butler, Anthony; and Neal, Peter Frederick, 4,101,242, Cl. 415-134.000.
Nebel, Dietrich; and Reicherter, Hans. Dewatering device including a drum with radially slanted cells. 4,101,374, Cl. 162-306.000.
Nechaev, Vladimir Viktorovich: *See—*
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
Needham, Brian John; and Smith, Michael Arthur, to Fisons Limited. Preparation of azines by a cascade system. 4,101,581, Cl. 260-566.00B.
Neenah Foundry Company: *See—*
Meyer, Jack M., 4,101,236, Cl. 404-25.000.
Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Incremental measuring system. 4,101,764, Cl. 250-237.00G.
Nelson, Donald F. Parking lot exit control means. 4,101,235, Cl. 404-6.000.
Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, to Bayer Aktiengesellschaft. Apparatus for the heat treatment of running threads by means of saturated steam. 4,100,660, Cl. 28-271.000.
Nessa, Christopher Eric. Blind fastener. 4,100,833, Cl. 85-3.00S.
Netherlands Offshore Company (Nederlandse Maatschappij voor Werken Buitengaats) B.V.: *See—*
Kaldenbach, Willem Paul, 4,100,873, Cl. 114-125.000.
Netzel, Philip C., to Gould Inc. Termination for stranded cable. 4,101,730, Cl. 174-75.00R.
Neudorfer, Robert J. Method for joining crossed support members to each other. 4,100,952, Cl. 144-314.00B.
Neukermans, Armand Paul; and Kruger, William Paul, to Hewlett-Packard Company. Stable fiber optic scintillative X-ray screen and method of production. 4,101,781, Cl. 250-483.000.
Neupokoev, Georgy Petrovich: *See—*
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
New Century Novelty Company Pty. Limited: *See—*
Richards, Basil James, 4,101,016, Cl. 194-97.00A.
Newburgh, Ronald G., to Electronics Corporation of America. Lead sulfide activation process. 4,101,452, Cl. 252-501.000.
Neyret, Guy, to Societe Anonyme dite: Etablissements GENOUD & CIE. Pressure regulator for gas lighter. 4,101,262, Cl. 431-344.000.
Nichols, George Frederick: *See—*
Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 4,101,402, Cl. 204-192.00C.
Nichols, Richard D. E.: *See—*
Bianchi, John E.; and Nichols, Richard D. E., 4,101,060, Cl. 224-2.00B.
Nicholson, John Patrick, to Nicholson Realty Ltd. Stabilized mixture. 4,101,332, Cl. 106-85.000.
Nicholson Realty Ltd.: *See—*
Nicholson, John Patrick, 4,101,332, Cl. 106-85.000.
Nicolaides, Ernest D.; and Tinney, Francis John, to Parke, Davis & Company. Octapeptides and methods for their production. 4,101,537, Cl. 260-112.5LH.
Niederprum, Hans: *See—*
Bockelman, Wolfgang; and Niederprum, Hans, 4,101,271, Cl. 8-94.260.
Niedzwiecki, Joseph F.: *See—*
Butterworth, Arthur L.; and Niedzwiecki, Joseph F., 4,100,934, Cl. 137-512.000.
Nienburg, Hans Juergen; and Kummer, Rudolf, to BASF Aktiengesellschaft. Production of bis-(dimethyl) acetals of hexane dialdehydes. 4,101,588, Cl. 260-615.00A.
Nihon Beru-Haueru Kabushiki Kaisha: *See—*
Aoyama, Eiji, 4,101,843, Cl. 330-280.000.
Nikota, John P. Fishing lure-and-line snap swivel. 4,100,658, Cl. 24-231.000.
Nilsson, Kenth; and Ekstrom, Olov, to Siemens Aktiengesellschaft. Flow meter with piezo-ceramic resistance element. 4,100,798, Cl. 73-194.00E.
Nims, Jerry Curtis: *See—*
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,101,210, Cl. 353-7.000.
Nippon Chemiphar Co., Ltd.: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.): *See—*
Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, 4,101,133, Cl. 274-23.00R.
Nippon Mektron Kabushiki Kaisha: *See—*
Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, 4,101,361, Cl. 156-250.000.
Nippon Oil Company Ltd.: *See—*
Nambu, Masao; Yamamoto, Syunichi; and Koiwai, Yoshihisa, 4,101,635, Cl. 423-242.000.
Nippon Shinyaku Company, Limited: *See—*
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, 4,100,895, Cl. 123-117.00R.
Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.
Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, 4,100,734, Cl. 60-278.000.
Nippon Steel Corporation: *See—*
Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, 4,101,275, Cl. 23-230.00R.
Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, 4,101,312, Cl. 75-52.000.
Nishida, Minoru: *See—*
Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, 4,100,895, Cl. 123-117.00R.
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, to Mitsubishi Chemical Industries Limited; and Noda Institute for Scientific Research. Process for the microbiological oxidation of steroids. 4,101,378, Cl. 195-51.00G.
Nishimura, Kazuo: *See—*
Teraoka, Kazuharu; and Nishimura, Kazuo, 4,101,366, Cl. 156-378.000.

Nishimura, Masakatsu: *See*—
Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, 4,101,395, Cl. 204-98.000.
Nishiura, Ichiro: *See*—
Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.
Nishiyama, Hissei: *See*—
Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, 4,100,943, Cl. 139-201.000.
Nissan Chemical Industries, Ltd.: *See*—
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.
Nissan Motor Company, Limited: *See*—
Asano, Masaharu, 4,100,892, Cl. 123-32.0EE.
Kita, Toru; and Fujishiro, Takeshi, 4,101,403, Cl. 204-195.00S.
Mizuno, Yukio, 4,100,947, Cl. 139-453.000.
Muraishi, Masakazu; and Sekino, Takao, 4,101,169, Cl. 297-341.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Takagi, Yasuo, 4,100,736, Cl. 60-278.000.
Nakanishi, Keiichi, 4,101,181, Cl. 308-36.000.
Sugihara, Kunihiko, 4,100,737, Cl. 60-292.000.
Nissei Plastics Industrial Co., Ltd.: *See*—
Aoki, Katashi, 4,101,618, Cl. 264-97.000.
Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, to Friedrich Uhde GmbH. Process for the production of hydrogen/deuterium-containing gas. 4,101,645, Cl. 423-648.00A.
Nitto Electric Industrial Co., Ltd.: *See*—
Ishizuka, Takashi; and Miwa, Naoki, 4,101,488, Cl. 260-29.20N.
Niwa, Shinichi: *See*—
Taketani, Yutaka; and Niwa, Shinichi, 4,101,458, Cl. 252-62.200.
Noctua, Inc.: *See*—
Christensen, Craig M., 4,101,199, Cl. 350-152.000.
Noda Institute for Scientific Research: *See*—
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, to Fujimi Kenmazai Kogyo Co., Ltd.; and Toyo Engineering Corporation. Catalyst and its method of preparation. 4,101,449, Cl. 252-457.000.
Noiriel, Gilles: *See*—
Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, 4,101,456, Cl. 252-551.000.
Nolan, Joe M. Fuel vaporizer. 4,100,905, Cl. 123-141.000.
Noll, Klaus-Reinhold: *See*—
Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.
Nomura, Tatsuo: *See*—
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
Nonogaki, Saburo: *See*—
Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
Nordin, Dag, to ITT Industries, Incorporated. Bearing bracket assembly for a submersible motor driven pump. 4,101,139, Cl. 277-22.000.
Noren, Richard W.: *See*—
Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., 4,101,513, Cl. 526-193.000.
Norfield Manufacturing Co.,: *See*—
Cheak, Edward G., 4,100,661, Cl. 29-33.00K.
Norte-Klessmann & Co. K.G.: *See*—
Kohler, Walter, 4,100,837, Cl. 90-11.00R.
North American Systems, Inc.: *See*—
Menier, Vincent J., 4,101,627, Cl. 264-323.000.
Northrop Weaving Machinery Limited: *See*—
Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, 4,100,941, Cl. 139-449.000.
Northwestern Mutual Life Insurance Company, The: *See*—
Trumbull, Harold E.; Davis, Howard C.; and Yano, Robert A., 4,100,743, Cl. 60-639.000.
Northwestern University: *See*—
Epstein, Max; and Nalamwar, Ashok L., 4,101,852, Cl. 333-30.00R.
Norton, Robert O., to Labconco Corporation. Convertible, laminar flow biological safety cabinet apparatus. 4,100,847, Cl. 98-115.0LH.
Norwood, David, to Concorde Fibers, Inc. Production of shaped, high polymeric articles. 4,101,613, Cl. 264-40.300.
Norwood, Donald D.: *See*—
Hogan, John P.; and Norwood, Donald D., 4,101,722, Cl. 526-106.000.
Notelteirs, Victor Rosallie; and Vosters, Rene Maria, to U.S. Philips Corporation. Electric lamp with a torpedo shaped conductor tip. 4,101,798, Cl. 313-315.000.
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; by Maletin, Ljubov Alexeevna, administrator; and by Maletina, Tatyana Alexeevna, administrator. Method of manufacturing multilayer convex collared covers and bottoms for pressure vessels. 4,101,065, Cl. 228-155.000.
Novotny, Ronald J.: *See*—
Taylor, Frank D.; and Novotny, Ronald J., 4,101,835, Cl. 325-55.000.
Nuclear Engineering Co., Inc.: *See*—
Gablin, Kenneth A.; and Hansen, Larry J., 4,100,860, Cl. 109-83.000.
Nurk, Siegfried. Circular knitting machine method for manufacturing one piece panty hose or the like. 4,100,769, Cl. 66-177.000.
N.V. Klippan S.A.: *See*—
Schmelow, Harald Martin; Weman, Per Olof; and Arff, Heino, 4,101,092, Cl. 242-107.40B.
Nyman, Frederick Russell: *See*—
Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 4,101,402, Cl. 204-192.00C.
Nyu, Kiyosato: *See*—
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Kranefeld, Wilhelm; and Schneider, Helmut, 4,100,707, Cl. 52-115.000.
Obayashi, Hideki: *See*—
Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, 4,100,734, Cl. 60-278.000.
Obear, Robert F.: *See*—
Peirce, Allen E.; Obear, Robert F.; and Olson, David E., 4,100,700, Cl. 51-92.00R.
Oberhardt, Bruce J.; and Kopelman, Donald F., to Technicon Instruments Corporation. Non-invasive method and apparatus for instantaneous flow measurement of a segmented fluid stream. 4,100,797, Cl. 73-194.00E.
Obidniak, Andy, to H & F Faller Sales Corp. Ltd. Ornamental article for packages or the like. 4,101,032, Cl. 206-457.000.
O'Callaghan, Larry John. Underwater power head. 4,100,855, Cl. 102-48.000.
Occidental Petroleum Corporation: *See*—
Choi, Charles K., 4,101,412, Cl. 208-8.000.
Dolbear, Geoffrey E., 4,101,416, Cl. 208-108.000.
Lumpkin, Robert E., Jr., 4,101,263, Cl. 432-13.000.
Ochomogo, Oscar Rene, to Du Pont de Nemours, E. I., and Company. Selective herbicide. 4,101,308, Cl. 71-93.000.
Oehm, Klaus, to Volkswagenwerk Aktiengesellschaft. Gas bag safety device for flat steering wheel. 4,101,146, Cl. 280-731.000.
Oertel, Harald: *See*—
Uhrhan, Paul; Lantzsch, Reinhard; Oertel, Harald; Roos, Ernst; and Arlt, Dieter, 4,101,506, Cl. 260-45.80N.
OFA AG: *See*—
Hamel, Edmund, 4,100,727, Cl. 57-160.000.
Offner, Franklin F. Method and apparatus for determining the location of a leak in a pipe buried underground. 4,101,827, Cl. 324-65.00R.
Oganesyan, Oganes Vardanovich; and Pyanov, Nikolai Ivanovich, to Tsentralny Nauchno-Issledovatelsky Institut Travmatologii I Ortopedii Imeni N.N. Priorova. Apparatus for surgical treatment of bones and joints. 4,100,919, Cl. 128-84.00B.
Ogasawara, Takahisa: *See*—
Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, 4,101,493, Cl. 260-29.60R.
Ogasawara, Toyotsugu, to Tomy Kogyo Co., Inc. Transfer mechanism intended for use with movable figurines. 4,100,696, Cl. 46-40.000.
Ogawa, Haruki: *See*—
Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, 4,101,670, Cl. 424-300.000.
Ogino, Sadashi: *See*—
Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, 4,101,312, Cl. 75-52.000.
Ohashi, Michihiro: *See*—
Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.
Ohata, Katsuya: *See*—
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
Ohio State University Research Foundation, The: *See*—
Gassman, Paul G., 4,101,583, Cl. 260-575.000.
Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
Ohneda, Shoichi; and Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Color encoding video system with optical low pass filter. 4,101,929, Cl. 358-44.000.
Ohorodnik, Alexander: *See*—
Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.
Ohsawa, Mitsuo, to Sony Corporation. Differential amplifier. 4,101,842, Cl. 330-257.000.
Ohta, Hideo: *See*—
Fujishiro, Yuji; and Ohta, Hideo, 4,100,854, Cl. 101-415.100.
Ohtsu, Takaji: *See*—
Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,101,096, Cl. 242-199.000.
OK Machine & Tool Corp.: *See*—
Kober, Marvin; and Dvorak, Jarda, 4,100,670, Cl. 29-564.100.
Okada, Akio: *See*—
Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.
Okada, Akira: *See*—
Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.
Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, to Hitachi, Ltd. Gain control circuit. 4,101,841, Cl. 330-254.000.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-arylsulfonyl-argininamides and the pharmaceutically acceptable salts thereof. 4,101,653, Cl. 424-177.000.

Okano, Masao, to Toyo Valve Co., Ltd. Copper alloys with improved corrosion resistance and machinability. 4,101,317, Cl. 75-156.500.

Okano, Yukio: *See*—
Ohneda, Shoichi; and Okano, Yukio, 4,101,929, Cl. 358-44.000.

Okladnikov, Vladlen Alexeevich: *See*—
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Okorodudu, Abraham O. M., to Mobil Oil Corporation. Lubricant compositions containing organophosphorus derivatives of hydroxycarboxylic acids. 4,101,432, Cl. 252-49.800.

Okubo, Yoshioki: *See*—
Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, 4,101,621, Cl. 264-182.000.

Okudaira, Sadayuki: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.

Okuma Machinery Works Ltd.: *See*—
Maeda, Yutaka; and Kawabe, Mitsuhiro, 4,101,817, Cl. 318-603.000.

Okuno, Youichi: *See*—
Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, 4,101,912, Cl. 354-106.000.

Olin Corporation: *See*—
Harris, Frederick John, 4,100,834, Cl. 85-77.000.
Kircher, Morton S.; and Engler, Maynard F., 4,101,410, Cl. 204-282.000.
Larson, Harold V.; and Clark, Morris E., 4,101,636, Cl. 423-305.000.
Tobin, John H., 4,101,554, Cl. 260-290.0HL.

Oliveira, Joseph P., II. Touch-tone encoder unit for mobile radio transmitter. 4,101,871, Cl. 340-171.00R.

Oliver, J. Allen: *See*—
Smith, David W.; LeBlanc, Raymond C.; and Oliver, J. Allen, 4,101,100, Cl. 244-114.00R.

Olson, David E.: *See*—
Peirce, Allen E.; Obear, Robert F.; and Olson, David E., 4,100,700, Cl. 51-92.00R.

Olsson, Gunnar. Soil stabilizing apparatus. 4,100,861, Cl. 111-7.000.

Oltman, Herbert D. Drive and steering apparatus. 4,101,004, Cl. 180-6.200.

Olympia Werke AG: *See*—
Loock, Ehrenfried, 4,101,329, Cl. 106-22.000.

Olympus Optical Co., Ltd.: *See*—
Fukuoka, Kenji, 4,101,934, Cl. 358-261.000.
Imai, Toshihiro, 4,101,196, Cl. 350-96.310.
Koizumi, Toshimichi; and Unami, Miwako, 4,101,204, Cl. 350-224.000.
Maitani, Yoshihisa; and Kidawara, Atsushi, 4,101,911, Cl. 354-53.000.
Miyazaki, Kensaku; and Shinohara, Toshio, 4,101,194, Cl. 350-9.000.
Tojyo, Tsutomu, 4,101,201, Cl. 350-175.0ML.

Omita S.p.A.: *See*—
Germani, Cesare, 4,100,944, Cl. 139-439.000.

O'Neill, John Edward. Folded composite structure. 4,100,690, Cl. 40-154.000.

Ono, Akihiro: *See*—
Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, 4,101,275, Cl. 23-230.00R.

Ontario Research Foundation: *See*—
White, Robert Charles, 4,100,626, Cl. 3-1.910.

Oofusa, Masaatsu: *See*—
Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, 4,100,943, Cl. 139-201.000.

Oogami, Eiryo, to Yoshida Kogyo K.K. Adjustable transom assembly. 4,100,704, Cl. 52-65.000.

Orbital Collection Systems, Inc.: *See*—
Talenti, Pier F., 4,101,039, Cl. 214-83.320.

Orcutt, John W., to Texas Instruments Incorporated. Pressure relief valve. 4,100,930, Cl. 137-68.00R.

Orfeo, Sabatino R.: *See*—
Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,101,436, Cl. 252-67.000.

Orford, Raymond Leslie; and Smith, Dexter William, to Lucas Industries Limited. Sintered composition. 4,101,453, Cl. 252-503.000.

Ornberg, Stellan, to Kalmar Lans Landsting. Tilting unit for furniture substructures. 4,101,167, Cl. 297-328.000.

Ort, Morris R., to Monsanto Company. Preparation of polyesters of 1,2-bis(hydroxyphenyl)ethanes and aromatic dicarboxylic acids. 4,101,517, Cl. 528-271.000.

Osaka Transformer Co., Ltd.: *See*—
Uratani, Takafumi, 4,101,755, Cl. 219-124.310.

Osborne, William B., to Walter Kidde and Co., Inc. Monitored fire protection system. 4,101,887, Cl. 340-652.000.

Oskam, Aane Adriaan; and Koot, Hermanus Marinus Ignatius, to Industrie Koot B.V. Adjustable motor car mirror with compact electrically driven adjusting means. 4,101,206, Cl. 350-289.000.

Oswald, Alexis A.: *See*—
Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., 4,101,557, Cl. 260-327.00E.

Otani, Yuzo: *See*—
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.

O'Toole, Lawrence P. Externally-programable switch. 4,101,857, Cl. 335-206.000.

Otsuka, Koji: *See*—
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.

Otsuka, Shinya: *See*—
Ueno, Hiroshi; Otsuka, Shinya; Tsukamoto, Tetsuo; and Kishimoto, Akira, 4,101,534, Cl. 260-857.0TW.

Ott, Theodor; and Gaisser, Max, to Ott, Theodor. Cutter. 4,100,636, Cl. 7-158.000.

Otte, Dieter W.: *See*—
Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.

Outboard Marine Corporation: *See*—
Stolley, Ronald M., 4,101,040, Cl. 214-131.00R.
Travis, Robert R., 4,101,137, Cl. 277-1.000.

Owatonna Tool Company: *See*—
Doss, Daniel L.; and Melander, Robert A., 4,101,822, Cl. 324-16.00R.

Owen, David Peter; and Miles, Barry Donald Ruberry, to Quantel Limited. Video synchronizer with velocity compensation. 4,101,939, Cl. 360-36.000.

Owens-Corning Fiberglas Corporation: *See*—
Hill, Homer G.; and Pansius, William G., 4,101,334, Cl. 106-99.000.
Stalego, Joseph P., 4,101,475, Cl. 260-21.000.

Owens-Illinois, Inc.: *See*—
Amberg, Stephen W., 4,100,841, Cl. 93-1.00G.
Fein, Michael E.; and Salisbury, Charles W., 4,101,846, Cl. 331-94.50D.
Mallory, James D., 4,100,937, Cl. 137-596.160.
Rough, Robert R., Sr.; and Peters, Homer D. F., 4,100,680, Cl. 33-126.70A.
Schermerhorn, Jerry D.; and Miller, John W. V., 4,101,810, Cl. 315-169.0TV.
Taylor, Lynn J., 4,101,207, Cl. 350-344.000.
Taylor, Lynn J.; and Tobias, John W., 4,101,720, Cl. 526-3.000.

Oxy Metal Industries Corporation: *See*—
Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, 4,101,387, Cl. 204-43.00T.
Kaneko, Hideaki; Miyazaki, Yasushi; and Suzuki, Masanori, 4,101,339, Cl. 134-2.000.
Rones, Josef; and Geldner, Joachim, 4,101,437, Cl. 252-149.000.

Oy Tahka AB: *See*—
Lehtola, Erkki Topias, 4,100,819, Cl. 74-245.00R.

Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, to Nippon Soken, Inc. Exhaust gas purification system for an internal combustion engine. 4,100,734, Cl. 60-278.000.

P.D. Rasspe Soehne: *See*—
Schmitz, Hermann, 4,100,932, Cl. 137-488.000.

Pace, Wilson David: *See*—
Davis, William F.; and Pace, Wilson David, 4,100,907, Cl. 123-148.00S.

Pacific Engineering & Production Company of Nevada: *See*—
Rhees, Raymond C.; and Halker, Bruce B., 4,101,390, Cl. 204-57.000.

Pacific Western Systems: *See*—
Merryman, Wayne R., 4,101,761, Cl. 235-92.0CA.

Pagani, Giorgio, to Snamprogetti S.p.A. Radial-flow reactor for the synthesis of ammonia with production of high thermal-level steam. 4,101,281, Cl. 23-288.00K.

Page, Louis J. Ophthalmic device for tensionally securing lenses thereto. 4,101,208, Cl. 351-58.000.

Page, Roy Arthur, to Midland Designing & Manufacturing Co. Ltd., The. Inner tube splicing machines. 4,101,368, Cl. 156-503.000.

Palkiewicz, John Louis: *See*—
Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,101,693, Cl. 427-386.000.

Palma, Milton J., to Caterpillar Tractor Co. Service rack for lift trucks. 4,101,038, Cl. 214-44.00R.

Panavision, Incorporated: *See*—
Gottschalk, Robert E.; and Mayer, Albert L., 4,101,916, Cl. 354-219.000.

Panday, Vinod: *See*—
Ruggles, Richard L.; and Panday, Vinod, 4,101,786, Cl. 307-38.000.

Panetti, Romolo, to Speno International S.A.; and Frank Speno Railroad Ballast Cleaning Co., Inc. Process and a system for measuring and recording undulatory deformations of a rail surface. 4,100,795, Cl. 73-146.000.

Pankey, Titus, Jr.: *See*—
Thomas, Richard E.; and Pankey, Titus, Jr., 4,101,800, Cl. 313-346.0DC.

Panneman, Harm Jan, to Akzona Incorporated. Novel 2,6-di-substituted phenyl-aminoquanidine containing compositions and methods of using same and pharmaceutical compositions containing the same and therapeutic method. 4,101,675, Cl. 424-326.000.

Panov, Evgeny Petrovich: *See*—
Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Ar-

kadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.
Pansini, Andrew L. Swimming pool cleaners. 4,100,641, Cl. 15-1.700.
Pansius, William G.: *See—*
Hill, Homer G.; and Pansius, William G., 4,101,334, Cl. 106-99.000.
Pantland, Ernest Francis: *See—*
Pantland, Frederick William; and Pantland, Ernest Francis, 4,100,931, Cl. 137-77.000.
Pantland, Frederick William; and Pantland, Ernest Francis, to Fisher, Leonard Joseph. Fire damper. 4,100,931, Cl. 137-77.000.
Pappas, Dennis Gerasimos, to Aboyne Pty. Limited. Fire detection system. 4,101,872, Cl. 340-539.000.
Paquette, Francis A.; and Henze, Richard H. Closure cap and support for holding a bottle of carbonated beverage in inverted position. 4,101,044, Cl. 215-228.000.
Parisien, Rudolph E. Fence rail fastener. 4,101,226, Cl. 403-4.000.
Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., to Dow Chemical Company, The. Soft ethylenic polymer foams. 4,101,467, Cl. 521-79.000.
Parke, Davis & Company: *See—*
Nicolaides, Ernest D.; and Tinney, Francis John, 4,101,537, Cl. 260-112.5LH.
Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., to United States of America, Energy. Double deflection system for an electron beam device. 4,101,813, Cl. 315-370.000.
Parr, Edward Leon: *See—*
Straza, George Thomas; and Parr, Edward Leon, 4,100,787, Cl. 72-310.000.
Parry, Ruth Mary: *See—*
Wray, Gordon Richard; and Parry, Ruth Mary, 4,100,814, Cl. 74-43.000.
Partyka, Richard A.: *See—*
Crenshaw, Ronnie R.; and Partyka, Richard A., 4,101,548, Cl. 544-284.000.
Patrick, Charles: *See—*
Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, 4,100,955, Cl. 152-362.0CS.
Patterson, Robert A.; and Lacy, Larry D., to Rockwell International Corporation. Apparatus and method for effecting redundant control data transfer in a digital flight control system. 4,101,958, Cl. 364-200.000.
Patterson, William W., III; and Grapes, Eugene F. Connectors. 4,100,875, Cl. 114-251.000.
Patzschke, Hans-Peter; and Gobel, Armin, to Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung vorm. Otto Louis Herberts. Modified water-dilutable diolefin polymer oils containing carboxyl groups. 4,101,495, Cl. 260-29.7NR.
Paul Gillet GmbH: *See—*
Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, 4,101,280, Cl. 23-288.0FC.
Payne, Jimmy R.: *See—*
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,101,886, Cl. 165-14.000.
Payne, William J., to Modulus Corporation. Assembly method. 4,100,666, Cl. 29-407.000.
PBI, Inc.: *See—*
Bart, Philip D., 4,101,607, Cl. 261-36.00R.
Peacock, Bobbie D. Step construction employing insertable fastener having deformable projections. 4,100,997, Cl. 182-90.000.
Pecher, Wolfgang: *See—*
Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, 4,101,812, Cl. 315-241.00P.
Pecoraro, Ann. Body protector. 4,100,620, Cl. 2-102.000.
Pedain, Josef: *See—*
Bock, Manfred; Pedain, Josef; and Braden, Rudolf, 4,101,578, Cl. 260-563.00R.
Peech, John M.: *See—*
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Peirce, Allen E.; Obear, Robert F.; and Olson, David E., to Western Gear Corporation. Workpiece conditioning grinder system. 4,100,700, Cl. 51-92.00R.
Pelensky, Joseph: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,101,685, Cl. 427-8.000.
Pelt, Thomas E., to Badger Meter, Inc. Flow control assemblies. 4,100,800, Cl. 73-197.000.
Pelton, John Franklin, to Union Carbide Corporation. Control system for refuse compacter. 4,100,849, Cl. 100-41.000.
Pelz, Robert W.: *See—*
Whang, Tack J.; and Pelz, Robert W., 4,101,709, Cl. 428-433.000.
Pemper, Steven J. Casting process. 4,100,669, Cl. 29-527.600.
Penn Yan Boats, Incorporated: *See—*
Stuart, Robert B., 4,100,994, Cl. 181-261.000.
Pennella, Filippo: *See—*
Rycheck, Mark R.; and Pennella, Filippo, 4,101,592, Cl. 260-666.00P.
Pennwalt Corporation: *See—*
Kamens, Ernest Rudolph; Kressin, Donald Milton; Lange, Harold Carl; and MacLeay, Ronald Edward, 4,101,464, Cl. 521-88.000.
Sheppard, Chester Stephen; and MacLeay, Ronald Edward, 4,101,522, Cl. 528-292.000.
Pepe, Charles R. Machine suspended from a crane or similar device for driving and extracting piling and the like. 4,100,974, Cl. 173-49.000.
Peppel, William Jennings, all of: *See—*
Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, 4,101,515, Cl. 252-182.000.
Pepping, Roelf, to Machinefabriek W. Hubert & Co. B.V. Method for dewatering sludge. 4,101,400, Cl. 204-180.00R.
Perkin-Elmer Corporation, The: *See—*
Denison, Dean R.; and Kren, George J., 4,101,874, Cl. 340-606.000.
Pernyeszi, Joseph: *See—*
Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, 4,101,072, Cl. 235-455.000.
Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, to Bayer Aktiengesellschaft. Process for cold-hardening polyurethane foams using sulfonamide emulsifiers. 4,101,468, Cl. 521-115.000.
Peters, Edwin F.: *See—*
Jezl, James L.; and Peters, Edwin F., 4,101,289, Cl. 23-288.00E.
Peters, Homer D. F.: *See—*
Rough, Robert R., Sr.; and Peters, Homer D. F., 4,100,680, Cl. 33-126.70A.
Peters, Mark A.; and Johnson, Robert K., to Cyprus Metallurgical Processes Corporation. Recovery of silver from cuprous chloride solutions by co-crystallization with sodium chloride. 4,101,315, Cl. 75-104.000.
Peterson, James R. Tremolo for a string instrument. 4,100,832, Cl. 84-313.000.
Peterson, Marvin A., to General Electric Company. Coating medium. 4,101,487, Cl. 260-29.20N.
Petitpierre, Jean Claude; and Ramanathan, Visvanathan, to Ciba-Geigy Corporation. 3-Cyano-1,2,4-thiadiazolyl-5-czo dyestuffs. 4,101,541, Cl. 260-158.000.
Petrolite Corporation: *See—*
Landis, Joel Victor, 4,101,563, Cl. 260-425.000.
Quinlan, Patrick M., 4,101,674, Cl. 424-325.000.
Redmore, Derek, 4,101,654, Cl. 424-200.000.
Petschauer, Karl: *See—*
Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, 4,101,888, Cl. 343-7.0VM.
Pfenninger, Hans: *See—*
Gyarmathy, Georg; and Pfenninger, Hans, 4,100,745, Cl. 60-652.000.
Philagro S.A.: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,101,307, Cl. 71-88.000.
Philip, Alexander Schroder, to Plessey Handel und Investments AG. Control arrangement in a time-space-time (t-s-t) time division multiple (t.d.m.) telecommunication switching system. 4,101,737, Cl. 179-15.0AT.
Philips, Michael R., to Jonathan Temple Incorporated. Core construction for a sewing machine bobbin. 4,100,866, Cl. 112-231.000.
Phillips Petroleum Company: *See—*
Crowley, Ralph P., 4,101,415, Cl. 208-45.000.
Doss, Richard C.; and Walton, Edward L., 4,101,482, Cl. 260-27.0BB.
Doss, Richard C., 4,101,484, Cl. 260-27.0BB.
Fahey, Darryl R., 4,101,566, Cl. 260-439.00R.
Hogan, John P.; and Norwood, Donald D., 4,101,722, Cl. 526-106.000.
Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.
Ririe, Otis E., 4,101,282, Cl. 23-254.00R.
Rycheck, Mark R.; and Pennella, Filippo, 4,101,592, Cl. 260-666.00P.
Phillips, Talmadge V.: *See—*
Buff, Grier E.; and Phillips, Talmadge V., 4,101,753, Cl. 219-97.000.
Photo-Control Corporation: *See—*
Gallistel, Albert F.; and Lindenfelser, Jerome W., 4,101,913, Cl. 354-122.000.
Piech, Corina; and Schleicher, Wolfram, to Piech, Corina. Protective helmet. 4,100,619, Cl. 2-10.000.
Pieper, Helmut: *See—*
Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.
Pierce, Richard L.: *See—*
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,101,886, Cl. 165-14.000.
Pillsbury Company, The: *See—*
Reid, Francis R., 4,100,846, Cl. 93-94.00R.
Pilot Chemical Company: *See—*
Morrisroe, John J.; and Banigan, Thomas F., 4,101,589, Cl. 260-615.00B.
Pimshtein, Pavel Gdalievich: *See—*
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Pingitore, Peter: *See—*
Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.
Pintos, Jose Luis. Combination sun screen and pillow. 4,100,633, Cl. 5-337.000.
Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, to S.A.E.S. Getters S.p.A. Getter device with improved support member. 4,101,247, Cl. 417-48.000.

Pirotin, Shelden D.: *See*—
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Pitney-Bowes, Inc.: *See*—
Rastorguyeff, Andrew Wladimir, 4,101,121, Cl. 270-68.00A.
Place, Geoffrey; and Maguire, Edward John, Jr., to Procter & Gamble Company, The. Enzyme-containing automatic dishwashing composition. 4,101,457, Cl. 252-559.000.
Plank, Don A.: *See*—
Floyd, Joseph C.; and Plank, Don A., 4,101,511, Cl. 260-45.85T.
Plastic Forming Company, Inc., The: *See*—
Schurman, Peter T., 4,101,033, Cl. 206-521.000.
Pleschiutschnigg, Fritz-Peter: *See*—
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.
Plessey Handel und Investments AG: *See*—
Kent, Alan Hugh; and Fell, Peter Howard, 4,101,197, Cl. 350-96.170.
Philip, Alexander Schroder, 4,101,737, Cl. 179-15.0AT.
Waterworth, Peter; and Reid, Douglas Charles John, 4,101,193, Cl. 350-6.800.
Plessing, Kurt, to Fordertechnik Streicher GmbH. Stopcock with rotary and adjustable plug in the stopcock housing. 4,101,113, Cl. 251-214.000.
Ploeg, Johannes E. G., to Shell Oil Company. Process for the simultaneous removal of nitrogen and sulfur oxides from a gas stream. 4,101,634, Cl. 423-239.000.
Poist, John E., to Celanese Corporation. Platinum-tin hydroformylation catalyst. 4,101,564, Cl. 260-429.700.
Poist, John E., to Celanese Corporation. Hydroformylation catalyst. 4,101,565, Cl. 260-429.700.
Poitras, Edward J. Colorant dispenser having time sequence dispensing cycle. 4,101,055, Cl. 222-17.000.
Polaroid Corporation: *See*—
Gordon, Michael E., 4,101,701, Cl. 428-189.000.
Poll, Ian, to Shell Oil Company. Process for the removal of sulphur oxides from gases. 4,101,641, Cl. 423-567.00R.
Pollitzer, Ernest L.: *See*—
Hayes, John C.; and Pollitzer, Ernest L., 4,101,593, Cl. 260-666.00A.
Polpudnikov, Viktor Sergeevich: *See*—
Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, 4,101,079, Cl. 241-46.150.
Polymer Corporation, The: *See*—
Flemming, Norbert A., 4,100,827, Cl. 82-38.00A.
Polysar Limited: *See*—
Buckler, Ernest Jack; and Richmond, Michael Hugh, 4,101,050, Cl. 229-3.50R.
Edwards, Douglas Cameron; and Walker, John, 4,101,434, Cl. 252-52.00R.
Pons, Dick A.; and Bijker, Anno, to Synres International B.V. Process for preparing aqueous emulsions of addition polymers with built-in emulsifier. 4,101,490, Cl. 260-29.6MP.
Poole, Lynn A.; and Crain, Harry M., to United States of America, Navy. Analog-digital ratio detector. 4,101,839, Cl. 328-165.000.
Posner, Hyman: *See*—
Conners, John A.; and Posner, Hyman, 4,101,112, Cl. 251-148.000.
Possley, Glen G.; Massey, Robert G.; and Williams, Billy B., to Texas Instruments Incorporated. Self-aligned epitaxial method for the fabrication of semiconductor devices. 4,101,350, Cl. 148-175.000.
Post Office, The: *See*—
Midwinter, John Edwin; and Day, Clive Richard, 4,101,305, Cl. 65-145.000.
Postema, James R.: *See*—
Miller, John E.; and Postema, James R., 4,101,794, Cl. 310-71.000.
Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, to B. F. Goodrich Company, The. Pneumatic tire. 4,100,955, Cl. 152-362.0CS.
Potulov, Vyacheslav Mikhailovich: *See*—
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Poulin, Clyde J.; and Bryla, Theodore N., to United States of America, Navy. Deflagrative electronic component potting compound. 4,101,352, Cl. 149-19.200.
Powers, Edward J.: *See*—
Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.
PPG Industries, Inc.: *See*—
Ammons, Vernon G., 4,101,529, Cl. 528-67.000.
Barch, Herbert W.; and Bohy, August G., 4,100,723, Cl. 57-34.00B.
Barch, Herbert W.; and Bohy, August G., 4,100,726, Cl. 57-157.00F.
Bosso, Joseph F.; and Sturni, Lance C., 4,101,486, Cl. 260-29.2TN.
Johnson, Harlan B., 4,101,394, Cl. 204-77.000.
Johnson, Harlan B.; Martinsons, Aleksandrs; and Welch, Cletus N., 4,101,624, Cl. 264-273.000.
Prade, Ernstfried, to Mistral Windsurfing AG. Surfboard. 4,100,870, Cl. 114-39.000.
Pradon, Jacques. Telescopic set of steps with variable slope. 4,100,995, Cl. 182-1.000.
Pradt, Louis Atwater, to Sterling Drug, Inc. Regulation of a wet air oxidation unit for production of useful energy. 4,100,730, Cl. 60-39.050.
Precision Lamp: *See*—
DuNah, Richard E., 4,101,955, Cl. 362-104.000.
Preiss, Herbert: *See*—
Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, 4,100,660, Cl. 28-271.000.
Premier Industrial Corporation: *See*—
Moskal, John J., 4,101,483, Cl. 260-27.0BB.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See*—
Bako, Lazlo, 4,100,775, Cl. 70-3.000.
Preus, Paul. Protected aquatic sports area. 4,100,746, Cl. 61-1.00F.
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Prichard, Richard Michael Hesketh: *See*—
Richmond, Michael; and Prichard, Richard Michael Hesketh, 4,101,933, Cl. 358-254.000.
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Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, 4,101,455, Cl. 252-531.000.
Mast, John George, Jr., 4,101,053, Cl. 221-232.000.
Place, Geoffrey; and Maguire, Edward John, Jr., 4,101,457, Cl. 252-559.000.
Proctor, William L.: *See*—
Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 4,101,383, Cl. 195-103.50R.
Produits Chimiques Ugine Kuhlmann: *See*—
Champenois, Michel Maurice Luce, 4,101,269, Cl. 8-4.000.
Coispeau, Gerard Emile Edgard, 4,101,540, Cl. 260-147.000.
Ruf, Roland, 4,101,480, Cl. 260-23.0AR.
Stiot, Jean-Pierre Henri; Brouard, Claude Marie Henri Emile; and Leroy, Jean Marie Louis, 4,101,543, Cl. 260-162.000.
Progress Processing Limited: *See*—
Savelkouls, Leonardus Joseph, 4,101,356, Cl. 156-71.000.
Prowest Electronics Limited: *See*—
Sanders, Richard Norman; and Crossley, William James, 4,101,930, Cl. 358-183.000.
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Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Arkadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.
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Charves, Everett; Pulley, David F.; and Stander, Arthur O., 4,101,497, Cl. 260-31.20N.
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Gutridge, Jack E.; and Marulic, Walter J., 4,100,857, Cl. 105-323.000.
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Purcell, Robert F.; and Selleck, James R., Jr., to IMC Chemical Group, Inc. Composition. 4,101,433, Cl. 252-49.500.
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Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.
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Oganesyan, Oganes Vardanovich; and Pyanov, Nikolai Ivanovich, 4,100,919, Cl. 128-84.00B.
Quantel Limited: *See*—
Owen, David Peter; and Miles, Barry Donald Ruberry, 4,101,939, Cl. 360-36.000.
Quantor Corporation: *See*—
Ammann, Steve, 4,101,919, Cl. 354-319.000.
Questor Corporation: *See*—
Strong, Lawrence M.; and Rilling, Chester H., 4,101,042, Cl. 215-11.00R.
Quilliam, Robert Mark, to Marconi Company Limited, The. Electron beam reading arrangements. 4,101,935, Cl. 358-293.000.
Quinlan, Patrick M., to Petrolite Corporation. Halogen derivatives of alkynoxymethyl amines as microbiocides. 4,101,674, Cl. 424-325.000.
R. J. Reynolds Tobacco Co.: *See*—
Baker, Max Norris; and Martin, Julian Richard, 4,101,362, Cl. 156-235.000.
R & S Stanzformen GmbH: *See*—
Spengler, Ernst M., 4,100,844, Cl. 93-59.0ES.
Rabbitts, Leonard C. In-situ methods of extracting bitumen values from oil-sand deposits. 4,101,172, Cl. 299-2.000.
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Flint, John R.; and Rabindran, K. George, 4,101,763, Cl. 250-214.00R.
Radke, Edmund John, to Borg-Warner Corporation. Vibration damper with variable spring rate and damping friction. 4,101,015, Cl. 192-106.200.
Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, to Runrkohle, A. G. Method and device for lining chambers and galleries. 4,100,749, Cl. 61-45.00C.
Rahdener Maschinenfabrik August Kolbus: *See*—
Dietrich, Gunter, 4,100,639, Cl. 11-1.00R.
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oxidation resistant dispersion strengthened nickel-chromium alloys. 4,101,714, Cl. 428-639.000.
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Hirsch, Harold H.; and Rairden, John R., III, 4,101,713, Cl. 428-554.000.
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Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, 4,100,671, Cl. 29-568.000.
Ramanathan, Visvanathan: *See*—
Petitpierre, Jean Claude; and Ramanathan, Visvanathan, 4,101,541, Cl. 260-158.000.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Hindered piperidine carboxylic acids, metal salts thereof and stabilized compositions. 4,101,509, Cl. 260-45.75N.
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Dunning, Richard E.; and Rampelberg, Victor H., 4,101,698, Cl. 428-31.000.
Ranco Incorporated: *See*—
Houk, William J., 4,101,747, Cl. 200-83.00A.
Rand, Burton, to Autosonics, Inc. Solvent spray cleaning system for minimizing solvent losses. 4,101,340, Cl. 134-11.000.
Randall, Robert Paul: *See*—
LeMay, Christopher Archibald Gordon; and Randall, Robert Paul, 4,101,773, Cl. 250-401.000.
Randermann, Ervin, Jr., to Schlumberger Technology Corporation. Tubing tester valve apparatus. 4,100,969, Cl. 166-324.000.
Randwo, Albert: *See*—
Schunck, Gunter; and Randwo, Albert, 4,101,221, Cl. 356-205.000.
Rankin, Richard W.: *See*—
Stutt, Charles A.; and Rankin, Richard W., 4,101,834, Cl. 325-42.000.
Ranus, Walter J., Jr.; and McClure, Lester Dennis, to Napp Chemicals Inc. Bisbenzoin ethers and method of producing benzoin ethers. 4,101,584, Cl. 260-590.00D.
Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., to Sucrest Corporation. Process for recovering useful products from carbohydrate-containing materials. 4,101,338, Cl. 127-46.00B.
Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. Benzhydryl guanidines. 4,101,659, Cl. 424-248.560.
Rasmussen, Don H.; and Loper, Carl R., Jr., to Wisconsin Alumni Research Foundation. Micron sized spherical droplets of metals and method. 4,101,310, Cl. 75-0.50B.
Rastorguyeff, Andrew Wladimir, to Pitney-Bowes, Inc. Document folding apparatus. 4,101,121, Cl. 270-68.00A.
Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., to GF Business Equipment, Inc. Chair control mechanism. 4,101,166, Cl. 297-304.000.
Ray, Richard James, Jr.; Kopy, Daniel Paul; and Rohweder, Theodore Richard, to Johns-Manville Corporation. Thermally insulating duct liner. 4,101,700, Cl. 428-131.000.
Raymond Lee Organization, Inc., The: *See*—
Carlson, Fred E., 4,100,652, Cl. 24-3.00R.
Gabor, Charles K., 4,100,642, Cl. 15-114.000.
Marquez, Manuel J., 4,100,998, Cl. 182-116.000.
Minard, Marguerite F., 4,101,104, Cl. 248-95.000.
RCA Corporation: *See*—
Andrevski, Zygmunt Marian, 4,101,802, Cl. 313-422.000.
Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, 4,101,907, Cl. 346-135.000.
Dischert, Robert Adams; Banks, Arthur James; and Hopkins, Robert Sherman, Jr., 4,101,926, Cl. 358-17.000.
Farmer, Felta Carl, Jr., 4,101,823, Cl. 324-20.0CR.
Haferl, Peter Eduard, 4,101,814, Cl. 315-371.000.
Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 4,101,402, Cl. 204-192.00C.
Willis, Donald Henry, 4,101,815, Cl. 315-411.000.
Reagan, William J.: *See*—
Chen, Nai Y.; and Reagan, William J., 4,101,595, Cl. 260-668.00A.
Redmore, Derek, to Petrolite Corporation. Microbiocidal process employing full quaternary nitrogen-heterocyclic phosphonates. 4,101,654, Cl. 424-200.000.
Reed Tool Co.: *See*—
Stone, Charles W., 4,100,976, Cl. 173-133.000.
Reeder, Thomas M.: *See*—
Cullen, Donald E.; and Reeder, Thomas M., 4,100,811, Cl. 73-654.000.
Reese, Robert O.; and Garrison, Donald W., to Time Computer, Inc. Wristwatch calculator with interface chip. 4,101,963, Cl. 364-705.000.
Reeves, George I.; and Keegan, Jack J., to Beckman Instruments, Inc. Magnetic pick up for use with electronic ignition systems. 4,101,859, Cl. 336-90.000.
Reggia, Frank: *See*—
Jones, Howard S., Jr.; and Reggia, Frank, 4,101,899, Cl. 343-788.000.
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Reiber, Johan H. C.: *See*—
United States of America, National Aeronautics and Space Administration; and Reiber, Johan H. C., 4,101,961, Cl. 364-417.000.
Reibetanz, Wilbert; Wanner, Karl; and Voss, Klaus, to Robert Bosch GmbH. Hole saw with particle-aspirating accessory for hand drill. 4,101,238, Cl. 408-59.000.
Reicherter, Hans: *See*—
Nebel, Dietrich; and Reicherter, Hans, 4,101,374, Cl. 162-306.000.
Reichhold Chemicals, Inc.: *See*—
Krause, Arthur Waldemar; and Korose, John, 4,101,293, Cl. 44-51.000.
Whang, Tack J.; and Pelz, Robert W., 4,101,709, Cl. 428-433.000.
Reid, Douglas Charles John: *See*—
Waterworth, Peter; and Reid, Douglas Charles John, 4,101,193, Cl. 350-6.800.
Reid, Francis R., to Pillsbury Company, The. Method of forming fiber cans. 4,100,846, Cl. 93-94.00R.
Reid, William P., to Tetrafluor, Inc. Peripherally grooved seal. 4,101,140, Cl. 277-165.000.
Reid, William P. Fluid purification device and ultraviolet lamp therefor. 4,101,777, Cl. 250-436.000.
Reil, Wilhelm. Packaging means. 4,101,051, Cl. 229-17.00R.
Reinecke, Harry; and Bachmann, Gerhard, to Frankl & Kirchner GmbH. & Co. KG. Fabrik fur Elektromotoren und elektrische Apparate. Apparatus for limiting maximum number of stitches of sewing-machines. 4,100,868, Cl. 112-277.000.
Reitz, Gunther; and Boehmke, Gunther, to Bayer Aktiengesellschaft. Water-soluble phenol/formaldehyde condensation products. 4,101,489, Cl. 260-29.300.
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Barbot, Jean Luc Y.; and Remon-Beauvais, Philippe M., 4,100,989, Cl. 180-127.000.
Remy, Rolf: *See*—
Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., 4,100,796, Cl. 73-160.000.
Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, to Colgate-Palmolive Company. Light duty liquid detergent. 4,101,456, Cl. 252-551.000.
Renfro, Arthur B., Jr.: *See*—
Sloan, Marlo S.; and Renfro, Arthur B., Jr., 4,101,067, Cl. 228-222.000.
Renner, Alfred, to Ciba-Geigy AG. Process for the manufacture of highly disperse solids consisting of crosslinked urea-formaldehyde polycondensation products. 4,101,521, Cl. 528-242.000.
Repetto, Silvio, to S.p.A. Luigi Rizzi & C. Drying press for hides. 4,100,773, Cl. 69-48.000.
Republic Steel Corporation: *See*—
Baker, Richard G.; Vild, Joseph P.; Griesfelder, Charles; and Fox, Donald P., 4,101,832, Cl. 324-227.000.
Buff, Grier E.; and Phillips, Talmadge V., 4,101,753, Cl. 219-97.000.
Resch, Josef; Matuska, Jan; and Trejtnar, Jindrich, to Elitex Koncern textilniho strojirenstvi. Apparatus for withdrawing leno waste in weaving machines. 4,100,945, Cl. 139-291.00C.
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Rubinstein, Menachem; Simon, Shulamit; and Bloch, deceased; Rene, 4,101,380, Cl. 195-63.000.
Retsky, Michael Walter; and Schwartz, James W., to Zenith Radio Corporation. Arc suppression and static elimination system for a television CRT. 4,101,803, Cl. 315-3.000.
Reuter, Helmut: *See*—
Fricke, Jobst; and Reuter, Helmut, 4,101,840, Cl. 330-127.000.
Rexnord Inc.: *See*—
Anderson, William B.; and Yulga, Julius J., 4,101,180, Cl. 308-20.000.
Dumbeck, Robert F., 4,101,831, Cl. 324-166.000.
Reymore, Harold E., Jr.: *See*—
Lockwood, Robert J.; McLaughlin, Alexander; and Reymore, Harold E., Jr., 4,101,465, Cl. 521-118.000.
Rhees, Raymond C.; and Halker, Bruce B., to Pacific Engineering & Production Company of Nevada. Process for producing a lead dioxide coated anode from a lead electrolyte which contains dissolved bismuth. 4,101,390, Cl. 204-57.000.
Ribka, Joachim: *See*—
Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.
Rich, Daniel H.; and Gurwara, Sweet K., to Wisconsin Alumni Research Foundation. Solid phase synthesis of protected peptides. 4,101,721, Cl. 526-19.000.
Rich, Hubert Allen: *See*—
Bass, Sidney; and Rich, Hubert Allen, 4,100,867, Cl. 112-270.000.
Richard, Jean-Claude: *See*—
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.
Richards, Basil James, to New Century Novelty Company Pty. Limited. Coin testing apparatus. 4,101,016, Cl. 194-97.00A.
Richards, Earl. Golf mat. 4,101,130, Cl. 273-187.00A.
Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., to Phillips Petroleum Company. Apparatus for forming a container. 4,100,842, Cl. 93-39.00C.
Richesson, Maurice A.: *See*—
Lawson, Roger E.; and Richesson, Maurice A., 4,101,969, Cl. 364-900.000.
Richey, Vernon T. Tool for fishing an object from a bore hole. 4,101,157, Cl. 294-86.210.
Richmond, Michael; and Prichard, Richard Michael Hesketh, to Elliott Brothers (London) Limited. Television cameras. 4,101,933, Cl. 358-254.000.

Richmond, Michael Hugh: *See—*
Buckler, Ernest Jack; and Richmond, Michael Hugh, 4,101,050, Cl. 229-3.50R.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.
Ricoh Company, Ltd.: *See—*
Mochizuki, Nobuo; and Demizu, Hiromi, 4,100,884, Cl. 118-653.000.
Rieben, Horace Johnnie; and Taylor, Lawrence F., to International Paper Company. Produce field box and foldable blank for making it. 4,101,048, Cl. 229-34.00R.
Rietmuller, Karl Heinz, to VDO Adolf Schindling AG. Device for variably illuminating an object. 4,101,954, Cl. 362-26.000.
Rigbi, Zvi, to Technion Research and Development Foundation, Ltd. Formation of spheres of thermoplastic materials, especially glass. 4,101,301, Cl. 65-21.000.
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Sugimoto, Mitsuo, 4,101,646, Cl. 424-4.000.
Rilling, Chester H.: *See—*
Strong, Lawrence M.; and Rilling, Chester H., 4,101,042, Cl. 215-11.00R.
Ririe, Otis E., to Phillips Petroleum Company. Sample conditioner and analyzer. 4,101,282, Cl. 23-254.00R.
Ritter Brothers Enterprises, Inc.: *See—*
Ritter, Orville A.; and Ritter, Dale H., 4,101,081, Cl. 241-101.700.
Ritter, Dale H.: *See—*
Ritter, Orville A.; and Ritter, Dale H., 4,101,081, Cl. 241-101.700.
Ritter, Hans Georg: *See—*
Dorp, Walter Vom; Ritter, Hans Georg; and Witteck, Fritz, 4,100,786, Cl. 72-252.000.
Ritter, Orville A.; and Ritter, Dale H., to Ritter Brothers Enterprises, Inc. Hay loading, transporting and feeding system. 4,101,081, Cl. 241-101.700.
Robert Bosch GmbH: *See—*
Bosch, Paul, 4,100,840, Cl. 91-491.000.
Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, 4,100,897, Cl. 123-119.0EC.
Dietrich, Walter; and Bauer, Manfred, 4,100,843, Cl. 93-53.00M.
Eckert, Konrad; Knapp, Heinrich; and Stumpp, Gerhard, 4,100,904, Cl. 123-139.0AW.
Kramer, Manfred, 4,100,901, Cl. 123-139.0AW.
Leiber, Heniz, 4,100,792, Cl. 73-39.000.
Leussink, Reinhard; and Ruf, Walter, 4,100,908, Cl. 123-148.00E.
Mayer, Hermann, 4,101,910, Cl. 354-42.000.
Reibetanz, Wilbert; Wanner, Karl; and Voss, Klaus, 4,101,238, Cl. 408-59.000.
Roberts, Wm. Mel; and Kohn, Jean, to Baltek Corporation. Cryogenic container. 4,101,045, Cl. 220-404.000.
Rockwell International Corporation: *See—*
Christe, Karl O., 4,101,640, Cl. 423-462.000.
Henry, Rodney D., 4,101,707, Cl. 428-409.000.
Patterson, Robert A.; and Lacy, Larry D., 4,101,958, Cl. 364-200.000.
Slay, Larry G., 4,101,903, Cl. 346-33.00R.
Williams, Elmer A., 4,100,891, Cl. 123-32.0EB.
Rodden, Philip J.: *See—*
Duffy, Richard J.; and Rodden, Philip J., 4,100,882, Cl. 118-620.000.
Roemer, Robert E.: *See—*
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
Roesner, Bruce B.; and McGreivy, Denis J., to Hughes Aircraft Company. Integrated injection logic structure fabricated by outdiffusion and epitaxial deposition. 4,101,349, Cl. 148-175.000.
Rohm GmbH: *See—*
Friederich, Ernst, 4,101,617, Cl. 264-93.000.
Rohm and Haas Company: *See—*
Cenci, Harry J.; and Swift, Graham, 4,101,606, Cl. 260-857.0UN.
Rohweder, Theodore Richard: *See—*
Ray, Richard James, Jr.; Kopy, Daniel Paul; and Rohweder, Theodore Richard, 4,101,700, Cl. 428-131.000.
Roller, Hanno, to Fritz Eichenauer, Firma. Refractory granular embedding composition for electric heating coils. 4,101,760, Cl. 219-544.000.
Rolls-Royce Limited: *See—*
Coplin, John Frederick; Butler, Anthony; and Neal, Peter Frederick, 4,101,242, Cl. 415-134.000.
Romanov, Mikhail Ivanovich: *See—*
Surovikin, Vitaly Fedorovich; Sazhin, Gennady Vasilievich; Romanov, Mikhail Ivanovich; and Korenyak, Nikolai Kalistratovich, 4,101,639, Cl. 423-449.000.
Rones, Josef; and Geldner, Joachim, to Oxy Metal Industries Corporation. Inhibitor for aqueous acid solutions. 4,101,437, Cl. 252-149.000.
Roos, Ernst: *See—*
Uhrhan, Paul; Lantzsch, Reinhard; Oertel, Harald; Roos, Ernst; and Arlt, Dieter, 4,101,506, Cl. 260-45.80N.
Roos, Werner: *See—*
Schmieder, Helmut; Goldacker, Hubert; and Roos, Werner, 4,101,408, Cl. 204-272.000.
Roosa, Vernon D., to Stanadyne, Inc. Rotary distributor fuel injection pump. 4,100,903, Cl. 123-139.0AQ.
Rosen, Meyer Robert, to Union Carbide Corporation. Non-aqueous antifoam compositions. 4,101,442, Cl. 252-358.000.
Rosen, Meyer Robert; and Sterman, Samuel, to Union Carbide Corporation. Transient antifoam compositions. 4,101,443, Cl. 252-358.000.
Rosenberg, Frieda M. Shoulder strap. 4,100,924, Cl. 128-510.000.
Rosenthal, Arnold B.: *See—*
Jensen, Donald F.; Rosenthal, Arnold B.; and Ross, Charles O., 4,101,006, Cl. 400-144.300.
Rosman, Allan. Drive system for a moving mechanism. 4,100,822, Cl. 74-674.000.
Ross, Charles O.: *See—*
Jensen, Donald F.; Rosenthal, Arnold B.; and Ross, Charles O., 4,101,006, Cl. 400-144.300.
Ross, Douglas; and Blackburn, Keith. Trailer for handling container-carrying pallet frames. 4,101,144, Cl. 280-423.00B.
Rothgordt, Ulf: *See—*
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,101,908, Cl. 346-139.00C.
Rothrock, Arthur A. Method of splicing motion picture sound film. 4,101,357, Cl. 156-159.000.
Rougeot, Henri; and Roziere, Guy, to Thomson-CSF. Camera arrangement for scintigraphy. 4,101,770, Cl. 250-363.00S.
Rough, Robert R., Sr.; and Peters, Homer D. F., to Owens-Illinois, Inc. Sensing the level of molten glass in a tank. 4,100,680, Cl. 33-126.70A.
Rourat, Jean; and Rourat, Marcel. Machine for separating rolls of cloth from the shafts on which they are rolled. 4,100,665, Cl. 29-252.000.
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Rourat, Jean; and Rourat, Marcel, 4,100,665, Cl. 29-252.000.
Roussel Uclaf: *See—*
Martel, Jacques; Huynh, Chanh; and Buendia, Jean, 4,101,574, Cl. 260-544.00L.
Rowe, Eugene Hugh, to B. F. Goodrich Company, The. Unsaturated polyester molding compositions. 4,101,604, Cl. 260-862.000.
Rowe, Harry B.: *See—*
Lamberti, Thomas G.; and Rowe, Harry B., 4,101,632, Cl. 423-210.000.
Royal Tool Company, Inc.: *See—*
Barron, Alvie, 4,101,179, Cl. 308-4.00A.
Roziere, Guy: *See—*
Rougeot, Henri; and Roziere, Guy, 4,101,770, Cl. 250-363.00S.
Rubinstein, Menachem; Simon, Shulamit; and Bloch, deceased; Rene, to Research Products Rehovot Ltd. Process for the cross-linking of proteins. 4,101,380, Cl. 195-63.000.
Ruckert, Hans: *See—*
Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, 4,101,323, Cl. 96-35.000.
Rudy, Erwin. Cemented carbide-steel composites for earthmoving and mining applications. 4,101,318, Cl. 75-240.000.
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Gorgerat, Jean Pierre, 4,100,804, Cl. 73-363.900.
Ruehle, William H., to Mobil Oil Corporation. Marine detector spread having arrays of different lengths. 4,101,866, Cl. 340-7.00R.
Ruf, Roland, to Produits Chimiques Ugine Kuhlmann. Pigmentary printing paste additive. 4,101,480, Cl. 260-23.0AR.
Ruf, Walter: *See—*
Leussink, Reinhard; and Ruf, Walter, 4,100,908, Cl. 123-148.00E.
Ruff, George Robert; and Derrick, Danny O'Brian, to Shakespeare Company. Method of making a rung assembly for a ladder. 4,100,668, Cl. 29-523.000.
Ruggles, Richard L.; and Panday, Vinod, to Clemar Manufacturing Corporation. Master-satellite irrigation control system with remote proportional timing. 4,101,786, Cl. 307-38.000.
Ruhnau, Gerhard, to WABCO Westinghouse GmbH. Signal multiplier circuit for a vehicle anti-skid wheel sensor. 4,101,789, Cl. 307-220.00R.
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Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
Ruoti, Vincenzo; and Farioli, Felice, to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A. Process for the production of high viscosity polyamide by adding alkylene carbonate to molten polyamide. 4,101,532, Cl. 528-311.000.
Rupinski, Frederick Alexander: *See—*
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
Rush, Donald W. Mail delivery alarm system. 4,101,877, Cl. 340-569.000.
Russell, David D.; and Shkapenko, George, to Samuel Moore & Company. Polyol blends and polyurethane prepared therefrom. 4,101,439, Cl. 252-182.000.
Russell, George F. Laminating travelling press. 4,101,370, Cl. 156-555.000.
Russer, Peter, to Licentia Patent-Verwaltungs-G.m.b.H. Method of and arrangement for producing coherent mode radiation. 4,101,845, Cl. 331-94.50M.
Russo, Robert V., to M & T Chemicals Inc. High resiliency foam with improved load bearing ability by use of organotin mercaptides. 4,101,471, Cl. 521-121.000.
Ruti Machinery Works Ltd.: *See—*
Tschudi, Rudolf, 4,100,942, Cl. 139-1.00R.
Rutledge, Charles Thomas: *See—*
Linstromberg, William John; and Rutledge, Charles Thomas, 4,100,761, Cl. 62-137.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols catalyzed by metal complexes of imino acid compounds. 4,101,561, Cl. 260-396.00N.

Ryan, Peter; and Bradley, Harry, to Lucas Industries Limited. Automatic indexing mechanism. 4,100,817, Cl. 74-111.000.

Rycheck, Mark R.; and Pennella, Filippo, to Phillips Petroleum Company. Catalytic hydrogenation. 4,101,592, Cl. 260-666.00P.

Ryu, Shoji: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.

S.A.E.S. Getters S.p.A.: *See—*
Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, 4,101,247, Cl. 417-48.000.

S I G Schweizerische Industrie-Gesellschaft: *See—*
Luginbuhl, Pierre, 4,101,420, Cl. 209-104.000.

S.L.M. (Model) Engineers Limited: *See—*
Lewicki, Edward, 4,101,863, Cl. 338-128.000.

Sabourin, Edward T.: *See—*
Schulz, J. Gustav; and Sabourin, Edward T., 4,101,469, Cl. 521-83.000.

Sadler, John H. Apparatus for converting coal into gas substitutes. 4,101,295, Cl. 48-99.000.

Sage, Howard M.; and Abromavage, John C., to U-Haul International, Inc. Adjustable car top carrier support. 4,101,061, Cl. 224-42.10F.

Sahara, Hiroshi: *See—*
Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.

Saiki, Yoshio: *See—*
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.

Saint-Gobain Industries: *See—*
Fischer, Klaus; and Keul, Robert, 4,101,705, Cl. 428-220.000.

St.Martin, Norman P.: *See—*
Kulwicki, Bernard M.; and St.Martin, Norman P., 4,101,454, Cl. 252-514.000.

Saito, Nobuo; Yoshizawa, Shigeru; and Toyooka, Takashi, to Kogyo Gijutsuin, President of. Magnetic bubble module. 4,101,970, Cl. 365-2.000.

Saito, Nobuo: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.

Saitoh, Shin-Ichi: *See—*
Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.

Saitoh, Tomio: *See—*
Sumiyoshi, Keiji; and Saitoh, Tomio, 4,101,212, Cl. 355-3.0TR.

Sakai, Daniel S.: *See—*
Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.

Sakamoto, Seiji: *See—*
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.

Sakudo, Noriyuki: *See—*
Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.

Salisbury, Charles W.: *See—*
Fein, Michael E.; and Salisbury, Charles W., 4,101,846, Cl. 331-94.50D.

Samour, Carlos M.; and Vida, Julius A., to Bristol-Myers Company. Antiosteoporotic agents. 4,101,668, Cl. 424-275.000.

Samuel Moore & Company: *See—*
Russell, David D.; and Shkapenko, George, 4,101,439, Cl. 252-182.000.
Stine, Clifford R.; and Boyce, Jennings A., 4,101,699, Cl. 428-36.000.

Sanada, Seiji: *See—*
Isono, Katsuo; and Sanada, Seiji, 4,101,927, Cl. 358-27.000.

Sanders, Richard Norman; and Crossley, William James, to Prowest Electronics Limited. Television picture wiping. 4,101,930, Cl. 358-183.000.

Sandoz, Inc.: *See—*
Houlihan, William J., 4,101,553, Cl. 260-288.0CF.

Sandoz Ltd.: *See—*
Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, 4,101,547, Cl. 544-294.000.

Santoni, Cesar, to Greif Bros. Corporation. Clamping ring for removable covers of drums. 4,101,156, Cl. 292-256.690.

Sanyo Electric Co., Ltd.: *See—*
Taketani, Yutaka; and Niwa, Shinichi, 4,101,458, Cl. 252-62.200.

Sartori, Guido; and Savage, David W., to Exxon Research & Engineering Co. Process and composition for removing carbon dioxide containing acidic gases from gaseous mixtures. 4,101,633, Cl. 423-228.000.

Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, to Tokyo Shibaura Electric Co., Ltd. Electronic copying apparatus. 4,101,218, Cl. 355-57.000.

Sasaki, Shiro; Inukai, Mitsuo; and Tokai Rika Denki Seisakusho K.K., to Toyota Jidosha Kogyo Kabushiki Kaisha. Tongue plate for seat belt device. 4,101,171, Cl. 297-389.000.

Sassak, Frank. Program controlled tube bending machine and a binary feed mechanism for use therein. 4,100,780, Cl. 72-7.000.

Sata, Toshikatsu: *See—*
Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, 4,101,395, Cl. 204-98.000.

Sato, Jun-ichi: *See—*
Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, 4,101,795, Cl. 310-336.000.

Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, to Maruzen Oil Co., Ltd. Process for separation and purification of vinylphenol. 4,101,590, Cl. 568-750.000.

Sato, Nobuhiro: *See—*
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.

Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, to Sony Corporation. Color television receiver. 4,101,928, Cl. 358-28.000.

Sato, Tadazi: *See—*
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Satterwhite, Charles R. Aerial conveyor system. 4,101,019, Cl. 198-300.000.

Sauer, Walter, to Hans Giesbert KG. Apparatus for conveying bulk materials. 4,101,021, Cl. 198-668.000.

Savage, David W.: *See—*
Sartori, Guido; and Savage, David W., 4,101,633, Cl. 423-228.000.

Savelkouls, Leonardus Joseph, to Progress Processing Limited. Metal coating process. 4,101,356, Cl. 156-71.000.

Sazhin, Gennady Vasilievich: *See—*
Surovikin, Vitaly Fedorovich; Sazhin, Gennady Vasilievich; Romanov, Mikhail Ivanovich; and Korenyak, Nikolai Kalistratovich, 4,101,639, Cl. 423-449.000.

Schaar, Charles H., to Colgate-Palmolive Company. Diaper fastener. 4,100,921, Cl. 128-284.000.

Schaar, Lothar, to Heye, Hermann. Moulding tool. 4,101,306, Cl. 65-323.000.

Schachter, Joseph D. Key chain retainer. 4,100,779, Cl. 70-456.00R.

Schaefer, Wolfgang: *See—*
Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, 4,100,671, Cl. 29-568.000.

Schafer, Stefan: *See—*
Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.

Scheerer, Wolfgang, to A. Ehrenreich GmbH & Co. KG. Housing for a flexible coupling. 4,101,228, Cl. 403-137.000.

Scherbina, Oleg Vasilievich: *See—*
Levitov, Vladimir Ilich; Lyapin, Andrei Grigorievich; and Scherbina, Oleg Vasilievich, 4,101,727, Cl. 174-28.000.

Schering Aktiengesellschaft: *See—*
Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, 4,101,647, Cl. 424-5.000.

Schermerhorn, Jerry D.; and Miller, John W. V., to Owens-Illinois, Inc. System for and method of operating gas discharge display and memory. 4,101,810, Cl. 315-169.0TV.

Scheuing, Claus: *See—*
Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, 4,101,008, Cl. 188-1.00B.

Schieber, Hans; and Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Knitting machine pattern mechanism. 4,100,767, Cl. 66-75.200.

Schiffman, Murray M., to MBI, Inc. Method and apparatus for producing a design on a flat surface adapted to be formed into an arcuate surface. 4,101,373, Cl. 156-659.000.

Schimko, Reinhold: *See—*
Schieber, Hans; and Schimko, Reinhold, 4,100,767, Cl. 66-75.200.

Schinke, Franz: *See—*
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,101,908, Cl. 346-139.00C.

Schintlmeister, Wilfried, to Schwarzkopf Development Corporation. Coated cemented carbide elements. 4,101,703, Cl. 428-216.000.

Schlaifer, Nate: *See—*
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,101,886, Cl. 165-14.000.

Schleicher, Wolfram: *See—*
Piech, Corina; and Schleicher, Wolfram, 4,100,619, Cl. 2-10.000.

Schlumberger Technology Corporation: *See—*
Randermann, Ervin, Jr., 4,100,969, Cl. 166-324.000.

Schmedemann, Walter, to U.S. Philips Corporation. Apparatus for mechanically supporting a medical device in a plane. 4,101,779, Cl. 250-445.00R.

Schmelow, Harald Martin; Weman, Per Olof; and Arff, Heino, to N.V. Klippan S.A., a part interest. Universal emergency locking retractor. 4,101,092, Cl. 242-107.40B.

Schmid, Rolf; and Kreibich, Ursula, to Ciba-Geigy Corporation. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins. 4,101,476, Cl. 260-22.0EP.

Schmidt, Gertraud A.; and Bopp, Louis A., to General Cable Corporation. Dispersion of antioxidant in cross-linkable polyethylene. 4,101,512, Cl. 260-45.95C.

Schmidt, Hartinus Thomsen, to Schmidt & Sonner Maskinfabrik A/S. Beater mill. 4,101,080, Cl. 241-51.000.

Schmidt, Paul. Displacement hammer apparatus for sinking and lining boreholes. 4,100,972, Cl. 173-23.000.

Schmidt, Paul. Pneumatic percussion boring device. 4,100,979, Cl. 175-19.000.

Schmidt & Sonner Maskinfabrik A/S: *See—*
Schmidt, Hartinus Thomsen, 4,101,080, Cl. 241-51.000.

Schmieder, Helmut; Goldacker, Hubert; and Roos, Werner, to Gesell-

schaft fur Kernforschung m.b.H. Countercurrent extraction column for liquid-liquid extraction. 4,101,408, Cl. 204-272.000.

Schmitz, Hermann, to P.D. Rasspe Soehne. Pipe burst safety device for natural gas pipe lines or the like. 4,100,932, Cl. 137-488.000.

Schmitz, Johannes Hubertus Antonius: *See—*
Wiedijk, Piet; Schmitz, Johannes Hubertus Antonius; and Van der Stap, Antonius Henricus Maria, 4,101,799, Cl. 313-331.000.

Schneider, Helmut: *See—*
Kranefeld, Wilhelm; and Schneider, Helmut, 4,100,707, Cl. 52-115.000.

Schneider, Richard: *See—*
Kohl, Lambert; Schneider, Richard; and Uhl, Karl, 4,101,027, Cl. 206-309.000.

Schoenauer, Wolfgang: *See—*
Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, 4,101,547, Cl. 544-294.000.

Schoepe, Adolf. Ball cock construction for controlling the level of liquids such as water in tanks. 4,100,928, Cl. 137-15.000.

Schoff, Dale H., to Bristol Products, Inc. Indicator device for modular heating cable. 4,101,190, Cl. 339-113.00L.

Scholz, Werner, to Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Circuit for delaying a composite video signal by a line duration, particularly for use with a video record player. 4,101,940, Cl. 360-37.000.

Schonfelder, Manfred: *See—*
Burkhardt, Tilo; and Schonfelder, Manfred, 4,101,530, Cl. 528-45.000.

Schooley, Willard A.; and Browne, Robert E., to Sun Chemical Corporation. Water jacket for ultraviolet lamp. 4,101,424, Cl. 250-504.000.

Schott, Adolf: *See—*
Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, 4,101,812, Cl. 315-241.00P.

Schrewe, Hans: *See—*
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.

Schreyer, Gerd: *See—*
Kruger, Manfred; Schreyer, Gerd; and Weiberg, Otto, 4,101,570, Cl. 260-502.00R.

Schroter, Herbert, to Hoechst Aktiengesellschaft. Developing apparatus for light-sensitive materials comprising an evaporator for evaporating a developer medium from a solution. 4,101,918, Cl. 354-299.000.

Schuander, Eric, to Alsten Company, The. Ring box with removable display stand. 4,101,023, Cl. 206-45.190.

Schubeis, Ewald Ingemar Emanuel. Self-closing hinge. 4,100,646, Cl. 16-54.000.

Schulten, Christian: *See—*
Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, 4,101,280, Cl. 23-288.0FC.

Schulz, J. Gustav; and Sabourin, Edward T., to Gulf Research & Development Company. Foamable resinous polymer compositions containing acid mixtures. 4,101,469, Cl. 521-83.000.

Schunck, Gunter; and Randwo, Albert, to Leybold-Heraeus GmbH & Co. KG. Process for the photo-optical measurement of the absorption behavior of solid, liquid and gaseous media. 4,101,221, Cl. 356-205.000.

Schur, Gotthold: *See—*
Herrmann, Lothar; and Schur, Gotthold, 4,100,983, Cl. 175-383.000.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Molded case for supporting and enclosing an article. 4,101,033, Cl. 206-521.000.

Schurr, Peter, to Endress & Hauser GmbH & Co. Sonic echo-sounder for the measurement of levels of substances. 4,101,865, Cl. 340-1.00L.

Schwartz, James W.: *See—*
Retsky, Michael Walter; and Schwartz, James W., 4,101,803, Cl. 315-3.000.

Schwarzkopf Development Corporation: *See—*
Schintlmeister, Wilfried, 4,101,703, Cl. 428-216.000.

Schymetzko, Karl-Heinz: *See—*
Kops, Friedrich; Kaufmann, Helmut; and Schymetzko, Karl-Heinz, 4,101,620, Cl. 264-177.00R.

Science Spectrum, Inc.: *See—*
Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 4,101,383, Cl. 195-103.50R.

Scientific-Atlanta, Inc.: *See—*
Clayton, Lorimer, Jr.; and Livaditis, Elias J., 4,101,837, Cl. 325-347.000.

Scientific Technology Incorporated: *See—*
Key, Paul Franklyn; and Lazzara, Anthony Ross, 4,101,784, Cl. 250-555.000.

Scott, John H.; and Weist, Walter R., to Boeing Company, The. Protective control system for water-jet propulsion systems. 4,100,877, Cl. 115-11.000.

Scott, Timothy C.: *See—*
Davis, Gerald L.; and Scott, Timothy C., 4,100,762, Cl. 62-160.000.

Scully, Andrew J., to United States of America, Army. Easy access oil filter drain system. 4,101,000, Cl. 184-1.500.

Seaberg, David H.; and Kao, Gou-Lian, to J. I. Case Company. Method and apparatus for steering. 4,100,738, Cl. 60-327.000.

Seanor, Donald A.: *See—*
Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.

Seco Manufacturing, Inc.: *See—*
Davey, John T.; and Kahn, Lawrence P., 4,100,933, Cl. 137-495.000.

Seguin, Ronald D.: *See—*
Mott, George E.; and Seguin, Ronald D., 4,100,753, Cl. 61-86.000.

Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, to Fujikura Cable Works, Ltd., The. Apparatus for twisting insulated conductors for use in multiconductor communication cable into quads. 4,100,721, Cl. 57-34.0AT.

Seimiya, Motoo: *See—*
Koseki, Isamu; and Seimiya, Motoo, 4,101,309, Cl. 75-0.5AB.

Sekine, Kenichi: *See—*
Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.

Sekino, Takao: *See—*
Muraishi, Masakazu; and Sekino, Takao, 4,101,169, Cl. 297-341.000.

Selders, Matthias Peter, to Battelle Development Corporation. CdSe-SnSe photovoltaic cell. 4,101,341, Cl. 136-89.0TF.

Selick, David A.: *See—*
Feinberg, Robert S.; and Selick, David A., 4,101,029, Cl. 206-315.00B.

Seliger, Robert L., to Hughes Aircraft Company. Process for making patterns in resist and for making ion absorption masks useful therewith. 4,101,782, Cl. 250-492.00B.

Selleck, James R., Jr.: *See—*
Purcell, Robert F.; and Selleck, James R., Jr., 4,101,433, Cl. 252-49.500.

Sellers, Edward C.; and Malkani, Chandler, to Xerox Corporation. Magnetic imaging method. 4,101,320, Cl. 96-1.400.

Sellinger, Du Wayne M.: *See—*
Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.

Sendo, Yuji: *See—*
Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.

Sensabaugh, Paul F., to General Electric Company. Device for attaching a microphone-speaker to an article of clothing. 4,100,653, Cl. 24-3.00J.

Sensors, Inc.: *See—*
Lennington, John W.; and Szeles, Donald M., 4,101,767, Cl. 250-339.000.

Seruga, Edward A.: *See—*
Bradham, Allen C., III; and Seruga, Edward A., 4,100,799, Cl. 73-197.000.

Seshima, Kensuke, to Mizuho Ika Kogyo Kabushiki Kaisha. Electrically driven, separate type, surgical operation table. 4,101,120, Cl. 269-323.000.

Settineri, William J.: *See—*
Frenier, Wayne W.; and Settineri, William J., 4,101,438, Cl. 252-151.000.

Sexton, Paul: *See—*
Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.

Seyb, Edgar J., Jr.: *See—*
Chessin, Hyman; and Seyb, Edgar J., Jr., 4,101,388, Cl. 204-43.00T.

Sgarlato, Thomas E.; Eston, Gary A.; and Freeman, Thomas E. Shoe sole construction. 4,100,686, Cl. 36-29.000.

Shaffer, John W.; Mecone, David W.; and Colville, William T., to GTE Sylvania Incorporated. Multilamp photoflash assembly with rotatable actuator. 4,101,259, Cl. 431-93.000.

Shaffer, Robert C., to Hitco. Coating for fibrous carbon material in boron containing composites. 4,101,354, Cl. 156-60.000.

Shaffer, Walter Moore, to Caterpillar Tractor Co. Pressure sensitive charging means for a steering system. 4,100,739, Cl. 60-413.000.

Shah, Pradeep L.; and Fuller, Clyde R., to Texas Instruments Incorporated. Process for fabricating inexpensive high performance solar cells using doped oxide junction and insitu anti-reflection coatings. 4,101,351, Cl. 148-188.000.

Shakespeare Company: *See—*
Ruff, George Robert; and Derrick, Danny O'Brian, 4,100,668, Cl. 29-523.000.

Sharp, Jonathan E. Shock absorber for a safety belt lanyard. 4,100,996, Cl. 182-3.000.

Shaub, Harold, to Exxon Research & Engineering Co. Lubricant composition. 4,101,427, Cl. 252-32.70E.

Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Catalyst compositions especially useful for preparation of unsaturated acids. 4,101,448, Cl. 252-437.000.

Shel, Marat Moiseevich: *See—*
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.

Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich. Hearth electrode for melting furnaces. 4,101,725, Cl. 13-18.000.

Shell Oil Company: *See—*
Birke, August H., 4,101,429, Cl. 252-32.70E.
Gergen, William P.; and Davison, Sol, 4,101,605, Cl. 260-873.000.
Ploeg, Johannes E. G., 4,101,634, Cl. 423-239.000.
Poll, Ian, 4,101,641, Cl. 423-567.00R.
Snyder, John L., 4,101,498, Cl. 260-33.6AQ.

Shelton, Warren E., to Shelton, Warren E. Screens for side and rear door openings of vans and like vehicles. 4,100,957, Cl. 160-368.00R.
Shemtov, Sami: *See—*
Mooney, Thomas; and Shemtov, Sami, 4,101,103, Cl. 248-58.000.
Sheng, Sheng P., to Marietta Concrete Company. Mechanism for gripping hoops encircling building structures. 4,100,654, Cl. 24-20.00R.
Shepherd, Thomas: *See—*
Thawley, Clive Stafford; and Shepherd, Thomas, 4,101,150, Cl. 285-226.000.
Sheppard, Chester Stephen; and MacLeay, Ronald Edward, to Pennwalt Corporation. Azo compounds containing acylating function and azo containing polymers. 4,101,522, Cl. 528-292.000.
Shepter, Joseph J., to Vibra-Metrics, Inc. Switch control system. 4,101,816, Cl. 318-130.000.
Sherwin-Williams Company, The: *See—*
Cunningham, Arthur L.; and Mathai, John, 4,101,527, Cl. 528-73.000.
Vacek, Lubomir; and Foster, Harold M., 4,101,558, Cl. 260-328.000.
Shestak, Nikolai Petrovich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrøvich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
Sheterom, Samuel G., Jr.: *See—*
Speiser, Arthur S.; and Sheterom, Samuel G., Jr., 4,101,119, Cl. 269-203.000.
Shevlyakov, Ivan Davydovich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
Shiba, Tetsuo: *See—*
Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.
Shibata, Toshihiro: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,101,508, Cl. 260-45.80N.
Shibazaki, Kenji: *See—*
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
Shigeyuki, Kobayashi: *See—*
Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
Shih-Teng Chang, Richard; and Landsinger, Edmund Emil, to Mattel, Inc. Mechanical digital stopwatch. 4,100,728, Cl. 58-74.000.
Shilov, Leonid Alexandrovich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, to Sony Corporation. Memory type insulating gate field effect semiconductor device. 4,101,921, Cl. 357-23.000.
Shimizu, Akio: *See—*
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
Shimizu, Keizo; Maruyama, Takeshi; and Fujimura, Toshio, to Hitachi, Ltd. Self-cut-off power switch for a remote controlled electronic equipment. 4,101,878, Cl. 340-310.00R.
Shimizu, Kuniaki: *See—*
Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, 4,101,670, Cl. 424-300.000.
Shimizu, Shiegemitu: *See—*
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
Shinhara, Kazue, to Victor Company of Japan, Ltd. Automatic tape loading type reproducing apparatus having intermittent tape shifting capability. 4,101,936, Cl. 360-10.000.
Shinohara, Toshio: *See—*
Miyazaki, Kensaku; and Shinohara, Toshio, 4,101,194, Cl. 350-9.000.
Shionogi & Co., Ltd.: *See—*
Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.
Shipitalo, William M., to Towmotor Corporation. Split pillow block for mounting a differential. 4,100,986, Cl. 180-75.000.
Shivachev, Peter Lazarov: *See—*
Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, 4,101,186, Cl. 339-5.00S.
Shkapenko, George: *See—*
Russell, David D.; and Shkapenko, George, 4,101,439, Cl. 252-182.000.
Shoe, Theodore W., to Flexicore Co., Inc., The. Structural connection. 4,100,713, Cl. 52-648.000.
Shoemaker, John Robert: *See—*
Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, 4,101,189, Cl. 339-99.00R.
Shortte, Willard Harmond, Jr., to Milliken Research Corporation. Tufting machine. 4,100,863, Cl. 112-79.00R.
Shoupp, William E.; and Bratkowski, Walter V., to Westinghouse Electric Corp. Mechanically-powered electric generator for instant-photographic camera and other apparatus. 4,101,792, Cl. 310-15.000.
Shuji, Hasebe: *See—*
Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
Shvarts, Arkady Grigorievich: *See—*
Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Arkadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.
Sickler, Raymond W. Awning assembly. 4,100,703, Cl. 52-16.000.
Sico Incorporated: *See—*
Bue, Richard C.; and Carlson, Casey L., 4,100,858, Cl. 108-48.000.
Sieber, William J., to American Safety Equipment Corporation. Wheelchairs. 4,101,143, Cl. 280-42.000.
Siegmund, Robert: *See—*
Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, 4,100,650, Cl. 19-105.000.
Siemens Aktiengesellschaft: *See—*
Dotzer, Richard; and Stoger, Klaus, 4,101,386, Cl. 204-32.00R.
Grieger, Gerhard; and Bohrdt, Joaquin, 4,101,746, Cl. 200-82.00B.
Mueller, Horst, 4,101,739, Cl. 179-15.00A.
Nilsson, Kenth; and Ekstrom, Olov, 4,100,798, Cl. 73-194.00E.
Tihanyi, Jenoe; and Hoepfner, Voachim, 4,101,922, Cl. 357-23.000.
von Rauch, Moriz; and Veneklasen, Lee H., 4,101,778, Cl. 250-441.000.
Signetics Corporation: *See—*
Dao, Tich T., 4,101,734, Cl. 178-68.000.
Silfvast, William Thomas, to Bell Telephone Laboratories, Incorporated. Isotope enrichment by resonance trapping. 4,101,396, Cl. 204-157.10R.
Silver Seiko Co., Ltd.: *See—*
Kamikura, Shigeo; Itagaki, Hideaki; and Kawaoka, Ryoiti, 4,100,768, Cl. 66-75.200.
Sima, Gordon R., Jr.; and Taylor, John L., Jr., to Bendix Corporation, The. Light coupled read-out system for noise dosimeter. 4,100,810, Cl. 73-647.000.
Simon-Hartley Limited: *See—*
Austin, Eric Paul, 4,101,409, Cl. 204-277.000.
Simon, Paul: *See—*
Dahlstrom, Mark Sorensen; and Simon, Paul, 4,101,906, Cl. 346-75.000.
Simon, Shulamit: *See—*
Rubinstein, Menachem; Simon, Shulamit; and Bloch, deceased; Rene, 4,101,380, Cl. 195-63.000.
Singer Company, The: *See—*
Florence, Judit Katalin, 4,101,968, Cl. 364-900.000.
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
Previte, Peter Luciano, 4,100,813, Cl. 74-5.00F.
Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, 4,101,072, Cl. 235-455.000.
Siuta, Theodore L.: *See—*
Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, 4,101,041, Cl. 215-6.000.
Sivakov, Jury Mikhailovich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
Skaife, Margaret R., Trustee: *See—*
Skaife, William, 4,100,699, Cl. 47-81.000.
Skaife, William, to Skaife, Margaret R., Trustee. Aerated continuously watered plant and seed organic growing medium and container for same. 4,100,699, Cl. 47-81.000.
Skuran, Victor, to Transco Inc. Prefabricated insulating panel. 4,100,711, Cl. 52-489.000.
Slay, Larry G., to Rockwell International Corporation. Method and apparatus for monitoring bcd continuously varying data. 4,101,903, Cl. 346-33.00R.
Sloan, Marlo S.; and Renfro, Arthur B., Jr., to Sloan Purge Products Co., Inc. Heat sink welding and purging apparatus. 4,101,067, Cl. 228-222.000.
Sloan Purge Products Co., Inc.: *See—*
Sloan, Marlo S.; and Renfro, Arthur B., Jr., 4,101,067, Cl. 228-222.000.
Slone, Norman. Box-spring assembly. 4,100,631, Cl. 5-239.000.
Small, Hamish; and Stevens, Timothy S., to Dow Chemical Company, The. High performance ion exchange composition. 4,101,460, Cl. 521-28.000.
Smartt, Roger H.: *See—*
Furuya, Seiji; and Smartt, Roger H., 4,101,024, Cl. 206-102.000.
Smathers, Donald Lee, to Du Pont de Nemours, E. I., and Company. Process for making lower alkyl formamides. 4,101,577, Cl. 260-561.00R.

Smith, Carl H., to Auto Research Corporation. Dual timer with delay. 4,101,001, Cl. 184-6.400.
Smith, David W.; LeBlanc, Raymond C.; and Oliver, J. Allen, to Value Engineering Company. Aircraft flight line servicing system. 4,101,100, Cl. 244-114.00R.
Smith, Dexter William: *See—*
Orford, Raymond Leslie; and Smith, Dexter William, 4,101,453, Cl. 252-503.000.
Smith, Gerald P., to NCR Corporation. Drawer operated switch assembly. 4,101,745, Cl. 200-61.610.
Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., to Texaco Inc. Method and a support assembly for supporting an air ring in a regenerator in a fluid catalytic cracking unit. 4,101,288, Cl. 23-288.00B.
Smith, Jay, III; and Conroy, Richard F. M., to Hasbro Development Corp. Sound reproducing unit tone arm. 4,101,134, Cl. 274-23.00R.
Smith, Jay, III; and Conroy, Richard F. M., to Hasbro Development Corp. Sound reproducing unit. 4,101,135, Cl. 274-39.00A.
Smith, Martin A. Variable width glass sphere dispenser. 4,101,058, Cl. 222-274.000.
Smith, Michael Arthur: *See—*
Needham, Brian John; and Smith, Michael Arthur, 4,101,581, Cl. 260-566.00B.
Smith, Oliver Wendell; and Koleske, Joseph Victor, to Union Carbide Corporation. High solids coating compositions. 4,101,603, Cl. 260-850.000.
Smithkline Corporation: *See—*
Berges, David A., 4,101,656, Cl. 424-246.000.
DeMarinis, Robert M.; and Weisbach, Jerry A., 4,101,657, Cl. 424-246.000.
Snamprogetti S.p.A.: *See—*
Pagani, Giorgio, 4,101,281, Cl. 23-288.00K.
SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Ruoti, Vincenzo; and Farioli, Felice, 4,101,532, Cl. 528-311.000.
Snyder, John L., to Shell Oil Company. Fire-resistant composition. 4,101,498, Cl. 260-33.6AQ.
S.p.A. Luigi Rizzi & C.: *See—*
Repetto, Silvio, 4,100,773, Cl. 69-48.000.
Societe Anonyme DBA: *See—*
Carre, Jean-Jacques; and Meyer, Yves, 4,101,176, Cl. 303-6.00C.
Societe Anonyme dite: Etablissements GENOUD & CIE: *See—*
Neyret, Guy, 4,101,262, Cl. 431-344.000.
Societe Distugil: *See—*
Branlard, Paul; and Merle, Jean Pierre, 4,101,481, Cl. 260-23.70A.
Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A.: *See—*
Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.
Societe Nationale des Poudres et Explosifs: *See—*
Biehler, Jean-Marie J.; Lecolier, Serge L.; and Le Roy, Patrice M., 4,101,472, Cl. 521-85.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.
Soderstrom, Melvin Andrew: *See—*
Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, 4,101,189, Cl. 339-99.00R.
Sokolowski, Eugene K., to Teletype Corporation. Paper edge sensor. 4,101,018, Cl. 400-582.000.
Solmon, Donald C.; and Lennon, Donald J. J., to Epp Corp. Magnetic inking apparatus for pulsed electrical printing. 4,101,909, Cl. 346-153.000.
Solovieff, Paul G.; and Cyran, Robert E., to Emhart Industries, Inc. Lockset having improved torque blade construction. 4,100,774, Cl. 70-380.000.
Soloviev, Gennady Ivanovich: *See—*
Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich, 4,100,708, Cl. 52-222.000.
Sommer, Lothar: *See—*
Linz, Friedrich; and Sommer, Lothar, 4,101,225, Cl. 401-119.000.
Sondern, Albertus Derk: *See—*
Elzinga, Johannes Mattheus; and Sondern, Albertus Derk, 4,101,774, Cl. 250-402.000.
Sony Corporation: *See—*
Hanai, Ichiro, 4,101,938, Cl. 360-16.000.
Isono, Katsuo; and Sanada, Seiji, 4,101,927, Cl. 358-27.000.
Nagasawa, Hiroyuki; and Kaneko, Kunio, 4,101,920, Cl. 357-17.000.
Ohsawa, Mitsuo, 4,101,842, Cl. 330-257.000.
Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.
Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
Takamatsu, Ryoji, 4,101,946, Cl. 360-105.000.
Uedaira, Satoru, 4,101,389, Cl. 204-44.000.
Southern, Edward M., to Upjohn Company, The. Extra-amniotic administration device. 4,100,923, Cl. 128-348.000.
Southern Imperial Coatings Corporation: *See—*
Lomasney, Henry L.; Lomasney, William J.; Metil, Ignatius; and Lagos, Dickens M., 4,101,692, Cl. 427-333.000.
Spada, Albert J.: *See—*
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
Span Instruments: *See—*
Gray, Tommy L.; and Crowe, Sam R., 4,100,812, Cl. 73-732.000.
Spanswick, James, to Standard Oil Company a corporation of Indiana. Fire retardant polymer. 4,101,510, Cl. 260-45.75B.
Spears, Robert Wayne. Trickle emitter for subterranean irrigation. 4,100,940, Cl. 137-877.000.
Speck, Ulrich: *See—*
Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, 4,101,647, Cl. 424-5.000.
Speckhart, Max: *See—*
Mayer, Rolf; and Speckhart, Max, 4,101,082, Cl. 241-282.100.
Speiser, Arthur S.; and Sheterom, Samuel G., Jr. Fluid-operated vise. 4,101,119, Cl. 269-203.000.
Spengler, Ernst M., to R & S Stanzformen GmbH. Box blank punching tool. 4,100,844, Cl. 93-59.0ES.
Speno International S.A.: *See—*
Panetti, Romolo, 4,100,795, Cl. 73-146.000.
Speranza, George P.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,101,462, Cl. 521-115.000.
Sperry Rand Corporation: *See—*
Lins, Stanley James; Lund, Roger Edward; and Hanson, Marlin Marshall, 4,101,972, Cl. 365-29.000.
Spin Physics: *See—*
Berchtold, Jean, 4,101,348, Cl. 148-105.000.
Spitze, LeRoy A.: *See—*
United States of America, National Aeronautics and Space Administration; Ballou, E. Vernon; Wood, Peter C.; Wydeven, Theordore J., Jr.; and Spitze, LeRoy A., 4,101,644, Cl. 423-581.000.
Spivack, John D., to Ciba-Geigy Corporation. Bis-piperazides of trisubstituted hydroxyphenylalkanoic acids. 4,101,550, Cl. 544-387.000.
Sponseller, David R.: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,101,602, Cl. 260-839.000.
Sprague, Brinton, to Cam Industries, Inc. Electric steam generator having a movable distribution means. 4,101,758, Cl. 219-285.000.
Sprague Electric Company: *See—*
Burn, Ian, 4,101,952, Cl. 361-305.000.
Spray Engineering Company: *See—*
Curran, James Hall, 4,101,073, Cl. 239-14.000.
Staff, Bonner W.: *See—*
Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., 4,100,808, Cl. 73-588.000.
Stafford, Donald Wayne: *See—*
Litkenhus, John Robert; and Stafford, Donald Wayne, 4,101,224, Cl. 400-328.000.
Stahl, Francis: *See—*
Kelly, William Tolson, III; and Stahl, Francis, 4,101,818, Cl. 320-2.000.
Stahl, Richard F.: *See—*
Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,101,436, Cl. 252-67.000.
Stalego, Joseph P., to Owens-Corning Fiberglas Corporation. Fiame resistant materials and method of making same. 4,101,475, Cl. 260-21.000.
Stanadyne, Inc.: *See—*
Roosa, Vernon D., 4,100,903, Cl. 123-139.0AQ.
Standard Oil Company, The: *See—*
Shaw, Wilfrid G.; and Terrill, David B., 4,101,448, Cl. 252-437.000.
Standard Oil Company a corporation of Indiana: *See—*
Jezl, James L.; and Peters, Edwin F., 4,101,289, Cl. 23-288.00E.
Spanswick, James, 4,101,510, Cl. 260-45.75B.
Stander, Arthur O.: *See—*
Charves, Everett; Pulley, David F.; and Stander, Arthur O., 4,101,497, Cl. 260-31.20N.
Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, to AEG-Elotherm, G.m.b.H. Apparatus for shearing metallic bars. 4,100,829, Cl. 83-106.000.
Stauffer Chemical Company: *See—*
Honig, Milton L., 4,101,446, Cl. 252-430.000.
Martines, Vincent C., 4,101,572, Cl. 260-543.00H.
Tilles, Harry, 4,101,555, Cl. 260-293.850.
Stauth, Tommy E. Manual impact stake driving apparatus. 4,101,088, Cl. 242-85.000.
Stearns, Clyde W. End dogging feeding device. 4,100,950, Cl. 144-242.00D.
Stedman, Robert N., to Caterpillar Tractor Co. Steering apparatus. 4,100,990, Cl. 180-135.000.
Steel Company of Canada, Limited, The: *See—*
Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.
Steil, Karl-Heinz: *See—*
Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.
Steinberg, Jacob H.: *See—*
Gulko, Arnold G.; and Steinberg, Jacob H., 4,101,923, Cl. 357-30.000.
Steiner, Edward L.: *See—*
Laskowski, Kenneth W.; and Steiner, Edward L., 4,101,213, Cl. 355-5.000.
Steiner, Karl Ulrich: *See—*
Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, 4,101,547, Cl. 544-294.000.

Stengel, Edgar: *See—*
Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.
Stephenson, Charles Francis: *See—*
Van Dyck, Kenneth Arthur; Wyatt, James Bartlett; Stephenson, Charles Francis; and Miller, Scott William, 4,101,757, Cl. 219-225.000.
Sterling Drug, Inc.: *See—*
Pradt, Louis Atwater, 4,100,730, Cl. 60-39.050.
Sterman, Samuel: *See—*
Rosen, Meyer Robert; and Sterman, Samuel, 4,101,443, Cl. 252-358.000.
Stevens, Petrus Franciscus: *See—*
Hempenius, Klaas; Van Mourik, Jan Cornelis; and Stevens, Petrus Franciscus, 4,101,883, Cl. 340-365.00R.
Stevens, Timothy S.: *See—*
Small, Hamish; and Stevens, Timothy S., 4,101,460, Cl. 521-28.000.
Stevenson, Richard Marshall: *See—*
Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, 4,101,387, Cl. 204-43.00T.
Stewart, Buster D. Van overhead console. 4,101,159, Cl. 296-37.700.
Stewart, Melvin E., to City Tank Corporation. Refuse vehicle hydraulic supply system. 4,100,740, Cl. 60-431.000.
Stiling, Rodney A., to National Gypsum Company. Continuous calcining of gypsum. 4,101,630, Cl. 423-171.000.
Stillman, Nathan, to Champion International Corporation. Bone resistant packaging material. 4,101,711, Cl. 428-474.000.
Stimple, James Roy: *See—*
Craig, Timothy Philip; and Stimple, James Roy, 4,101,836, Cl. 325-302.000.
Stine, Clifford R.; and Boyce, Jennings A., to Samuel Moore & Company. Synthetic resinous tube. 4,101,699, Cl. 428-36.000.
Stiot, Jean-Pierre Henri; Brouard, Claude Marie Henri Emile; and Leroy, Jean Marie Louis, to Produits Chimiques Ugine Kuhlmann. Benzene-azo-heterocyclic dyestuffs derived from alkyl aminocinnamates or aminocinnamide. 4,101,543, Cl. 260-162.000.
Stith, Morris Randall, Jr. Method of positioning and supporting a machine. 4,100,714, Cl. 52-741.000.
Stoger, Klaus: *See—*
Dotzer, Richard; and Stoger, Klaus, 4,101,386, Cl. 204-32.00R.
Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, to Burroughs Corporation. Scientific processor. 4,101,960, Cl. 364-200.000.
Stolley, Ronald M., to Outboard Marine Corporation. Vehicle for transporting palletized loads. 4,101,040, Cl. 214-131.00R.
Stone, Charles W., to Reed Tool Co. Pneumatic impact drilling tool. 4,100,976, Cl. 173-133.000.
Stone, David E., to Destron, Inc. Touch-responsive socket. 4,101,805, Cl. 315-74.000.
Stone & Webster Engineering Corporation: *See—*
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
Story Chemical Corporation: *See—*
Lander, Harry L., 4,101,473, Cl. 260-13.000.
Straesser, Chris Robert, to Caterpillar Tractor Co. Apex seal for rotary engines. 4,100,664, Cl. 29-156.600.
Straitz, John F., III, to Combustion Unlimited Incorporated. Pilot gas conservation system for flare stacks. 4,101,257, Cl. 431-15.000.
Straitz, John F., III, to Combustion Unlimited Incorporated. Flare gas stack with purge gas conservation system. 4,101,261, Cl. 431-202.000.
Stratabolt Corporation: *See—*
Hansen, Roger M., 4,100,748, Cl. 61-45.00B.
Stratton, Joseph B.: *See—*
Mounts, William T.; and Stratton, Joseph B., 4,101,160, Cl. 296-35.00R.
Straub, Wilhelm. Method and apparatus for controlling the air of combustion of carburetor engines. 4,100,900, Cl. 123-124.00R.
Strausak, Benedikt: *See—*
Vavrina, Josef; and Strausak, Benedikt, 4,101,182, Cl. 312-8.000.
Straza Enterprizes, Ltd.: *See—*
Straza, George Thomas; and Parr, Edward Leon, 4,100,787, Cl. 72-310.000.
Straza, George Thomas; and Parr, Edward Leon, to Straza Enterprizes, Ltd. Method and apparatus for making rectangular corrugated expansion joints. 4,100,787, Cl. 72-310.000.
Streib, Albrecht. Releasable assembly of structural members. 4,101,231, Cl. 403-252.000.
Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., to Xerox Corporation. Method of fusing toner images using functionalized polymeric release agents. 4,101,686, Cl. 427-22.000.
Striebel, Edmund Emil; Koblish, Theodore Richard; Madden, Thomas Joseph; and James, Roger Halsted, to United Technologies Corporation. Premix combustor. 4,100,733, Cl. 60-39.74B.
Strong, Lawrence M.; and Rilling, Chester H., to Questor Corporation. Bottle disc. 4,101,042, Cl. 215-11.00R.
Strongwater, Murray. Genuine leather fabric and method for making same. 4,100,623, Cl. 2-158.000.
Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, to Czechoslovenska akademie ved. Method for preparation of anion exchangers by substitution of hydrophilic polymeric gels. 4,101,461, Cl. 521-32.000.
Structural Fibers, Inc.: *See—*
Wiltshire, Arthur J., 4,101,254, Cl. 425-82.100.
Strupczewski, Joseph T.: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,101,663, Cl. 424-267.000.
Stuart, Robert B., to Penn Yan Boats, Incorporated. Marine exhaust silencer. 4,100,994, Cl. 181-261.000.
Stueben, Kenneth Charles: *See—*
Deem, Mary Lease; and Stueben, Kenneth Charles, 4,101,586, Cl. 260-593.00R.
Stull, Vincent R.: *See—*
Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 4,101,383, Cl. 195-103.50R.
Stumpp, Gerhard: *See—*
Eckert, Konrad; Knapp, Heinrich; and Stumpp, Gerhard, 4,100,904, Cl. 123-139.0AW.
Sturni, Lance C.: *See—*
Bosso, Joseph F.; and Sturni, Lance C., 4,101,486, Cl. 260-29.2TN.
Stutt, Charles A.; and Rankin, Richard W., to General Electric Company. Methods and apparatus for rejection of interference in a digital communications system. 4,101,834, Cl. 325-42.000.
Sucrest Corporation: *See—*
Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.
Sugihara, Kunihiko, to Nissan Motor Company, Limited. Exhaust gas purifying system employing an exhaust gas flow controller. 4,100,737, Cl. 60-292.000.
Sugimoto, Mitsuo, to Rikagaku Kenkyusho. Ferrite vascular contrast media. 4,101,646, Cl. 424-4.000.
Sukman, Edwin L., to M & T Chemicals Inc. Insecticidal and ovicidal method. 4,101,655, Cl. 424-204.000.
Sumi, Masao: *See—*
Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.
Sumitomo Chemical Company, Limited: *See—*
Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.
Sumiyoshi, Keiji; and Saitoh, Tomio, to Konishiroku Photo Industry Co., Ltd. Image transfer complementary apparatus for electrophotographic copying machine. 4,101,212, Cl. 355-3.0TR.
Sumrow, Paul E. Cover holder for evaporative cooler. 4,101,609, Cl. 261-105.000.
Sun Chemical Corporation: *See—*
Schooley, Willard A.; and Browne, Robert E., 4,101,424, Cl. 250-504.000.
Wolkowicz, Richard I., 4,101,706, Cl. 428-294.000.
Sun, Jui-Yuan: *See—*
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.
Sundstrand Corporation: *See—*
Davis, Gerald L.; and Scott, Timothy C., 4,100,762, Cl. 62-160.000.
Sundstrom, Karl Erik. Disposable reagent container and actuation mechanism. 4,101,283, Cl. 23-259.000.
Sunouchi, Akio: *See—*
Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, 4,101,912, Cl. 354-106.000.
SURELAB Superior Research Laboratories, Inc.: *See—*
Marschke, Jon V., 4,100,824, Cl. 81-121.00R.
Surovikin, Vitaly Fedorovich; Sazhin, Gennady Vasilievich; Romanov, Mikhail Ivanovich; and Korenyak, Nikolai Kalistratovich. Process for production of carbon black. 4,101,639, Cl. 423-449.000.
Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, to Hitachi, Ltd. Plasma etching apparatus. 4,101,411, Cl. 204-298.000.
Suzuki, Masanori: *See—*
Kaneko, Hideaki; Miyazaki, Yasushi; and Suzuki, Masanori, 4,101,339, Cl. 134-2.000.
Suzuki, Osamu; Ueda, Shozo; and Tashiro, Ichiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method of automatically piecing up a yarn in an open-end spinning machine and an open-end spinning machine for carrying out the same. 4,100,722, Cl. 57-34.00R.
Suzuki, Osamu: *See—*
Oishi, Kengo; and Suzuki, Osamu, 4,101,096, Cl. 242-199.000.
Suzuki, Seigo, to Tokyo Shibaura Electric Co., Ltd. Start and stop system. 4,101,732, Cl. 178-53.10R.
Suzuki, Yoshio: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
Svenska Dataregister Aktiebolag: *See—*
Englund, Gosta Roland; and Wincent, Karl Tommy, 4,101,017, Cl. 400-124.000.
Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, to Exxon Research & Engineering Co. Combined heat exchanger reactor. 4,101,287, Cl. 23-288.00K.
Sweetheart Plastic, Inc.: *See—*
Brown, Gaylord William, 4,101,252, Cl. 425-394.000.
Swessel, John A., Jr.: *See—*
Josemans, Leonardus J.; and Swessel, John A., Jr., 4,101,749, Cl. 200-317.000.
Swift, Graham: *See—*
Cenci, Harry J.; and Swift, Graham, 4,101,606, Cl. 260-857.0UN.

Swift, Harold Eugene: *See—*
Mitchell, Bruce Richard; and Swift, Harold Eugene, 4,101,417, Cl. 208-120.000.

Sybron Corporation: *See—*
Ensslin, Frieder Hans; and Hazen, Christopher Stevens, 4,101,775, Cl. 250-409.000.

Sycor, Inc.: *See—*
Butsch, Otto R., 4,101,945, Cl. 360-102.000.

Sylvester, Gordon: *See—*
Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, 4,101,041, Cl. 215-6.000.

Sylvester, Gordon C.: *See—*
Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., 4,100,938, Cl. 137-625.310.

Synres International B.V.: *See—*
Pons, Dick A.; and Bijker, Anno, 4,101,490, Cl. 260-29.6MP.

Szeberenyi, Szaboles: *See—*
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.

Szeles, Donald M.: *See—*
Lennington, John W.; and Szeles, Donald M., 4,101,767, Cl. 250-339.000.

Szporny, Laszlo: *See—*
Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.

Tadokoro, Eiichi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Method for cleaning flexible magnetic discs. 4,101,948, Cl. 360-137.000.

Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, to Nippon Steel Corporation; and Kokoshi Electric Co. Automatic photometric analyzer. 4,101,275, Cl. 23-230.00R.

Tajika, Shin-Ichi: *See—*
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.

Takagi, Katsuyuki; and Asano, Chihiro, to K.K. Tokai Rika Denki Seisakusho. Current limiting element for preventing electrical overcurrent. 4,101,862, Cl. 338-23.000.

Takagi, Yasuo: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; and Takagi, Yasuo, 4,100,736, Cl. 60-278.000.

Takahashi, Kaishuhiko: *See—*
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.

Takahashi, Takuya; and Ishigami, Masashi, to Bridgestone Tire Company Limited. Method for molding an article expanded at the center portion and having the maximum inner diameter at said portion for a liquid elastomer. 4,101,626, Cl. 264-313.000.

Takahashi, Taro. Tool holding apparatus in an NC lathe. 4,100,826, Cl. 82-25.000.

Takaishi, Naotake: *See—*
Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.

Takamatsu, Ryoji, to Sony Corporation. Tape playing machine with movable head mount. 4,101,946, Cl. 360-105.000.

Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, to Kao Soap Co., Ltd. Resin composition for powder coatings. 4,101,518, Cl. 528-100.000.

Takase, Tsuneo: *See—*
Aihara, Mitsuo; Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,101,838, Cl. 328-63.000.

Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, to Nippon Steel Corporation. Method for operation of a converter. 4,101,312, Cl. 75-52.000.

Taketani, Yutaka; and Niwa, Shinichi, to Sanyo Electric Co., Ltd. Electrolyte for electrolytic capacitors. 4,101,458, Cl. 252-62.200.

Takimoto, Yasukatsu, to Nakabayashi Kabushiki Kaisha. Binding machine. 4,100,640, Cl. 11-1.00R.

Talenti, Pier F., to Orbital Collection Systems, Inc. Apparatus for collecting and compacting waste material. 4,101,039, Cl. 214-83.320.

Talge, Henry J.; McNair, Samuel L.; and Zugenbuhler, Verne L., to Dazey Products Co. Hydrotherapy unit. 4,100,917, Cl. 128-66.000.

Tamai, Yasuo: *See—*
Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, 4,101,311, Cl. 75-0.500.

Tamakawa, Fumio: *See—*
Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.

Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.

Tamura, Kohki; and Iwamoto, Kazuo, to Hitachi Chemical Company, Ltd.; and Hitachi, Ltd. Battery of laminated structure having battery frame of novel structure. 4,101,718, Cl. 429-26.000.

Tamura, Motohiko: *See—*
Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.

Tamura, Tooru, to Aisin Seiki Kabushiki Kaisha. Flow restrictor. 4,100,894, Cl. 123-117.00A.

Tanaka, Eiji: *See—*
Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.

Tanaka, Makoto: *See—*
Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.

Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Automatic tape run-reversing device. 4,101,941, Cl. 360-74.000.

Tanaka, Yoshihiro: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.

Tanashin Denki Co., Ltd.: *See—*
Tanaka, Shinsaku, 4,101,941, Cl. 360-74.000.

Tardos, Laszlo: *See—*
Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.

Tashiro, Ichiro: *See—*
Suzuki, Osamu; Ueda, Shozo; and Tashiro, Ichiro, 4,100,722, Cl. 57-34.00R.

Tatemichi, Hidemaro: *See—*
Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, 4,101,493, Cl. 260-29.60R.

Tateoka, Kiyoshi; Ando, Hiromi; and Azuma, Tomizo, to Tokico Ltd. Vacuum augmentation device. 4,100,838, Cl. 91-1.000.

Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, to Vsesohuzny nauchno-issledovatelsku I Proktno-Konstruk torsky institut. Dobychi Uglya Grdravlicheskin Sposobom "Vallgidrougal". Centrifugal two-stage pump. 4,101,243, Cl. 415-201.000.

Tawara, Kinya: *See—*
Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.

Taylor, Frank D.; and Novotny, Ronald J., to General Communications Co., Inc. Method and electronic control device for radio telephone communication. 4,101,835, Cl. 325-55.000.

Taylor, John L., Jr.: *See—*
Sima, Gordon R., Jr.; and Taylor, John L., Jr., 4,100,810, Cl. 73-647.000.

Taylor, Lawrence F.: *See—*
Rieben, Horace Johnnie; and Taylor, Lawrence F., 4,101,048, Cl. 229-34.00R.

Taylor, Lynn J., to Owens-Illinois, Inc. Preparation of liquid crystal containing polymeric structure. 4,101,207, Cl. 350-344.000.

Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Degradable plastic. 4,101,720, Cl. 526-3.000.

Taylor, Paul D.: *See—*
Hwang, H. Shinn; and Taylor, Paul D., 4,101,450, Cl. 252-460.000.

Taylor, Raymond C.: *See—*
Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.

Taylor, Robert C.: *See—*
Wallace, Harry S.; and Taylor, Robert C., 4,101,049, Cl. 229-2.50R.

Team, Inc.: *See—*
Harrison, George W., 4,100,929, Cl. 137-15.000.

Technicon Instruments Corporation: *See—*
Oberhardt, Bruce J.; and Kopelman, Donald F., 4,100,797, Cl. 73-194.00E.
Watts, Leonard, 4,100,960, Cl. 164-119.000.

Technion Research and Development Foundation, Ltd.: *See—*
Rigbi, Zvi, 4,101,301, Cl. 65-21.000.

Tecumseh Products Company: *See—*
Aggen, Glenroy Newcomb, 4,101,371, Cl. 156-560.000.

Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
Scholz, Werner, 4,101,940, Cl. 360-37.000.

Teicher, Harry: *See—*
Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., 4,101,485, Cl. 260-29.4UA.

Teitel, Sidney: *See—*
Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, 4,101,738, Cl. 179-15.0FD.

Teledyne Industries, Inc.: *See—*
Bart, Hans U., 4,101,076, Cl. 239-584.000.
Grissinger, Glenn R., 4,100,848, Cl. 99-353.000.

Telefonaktiebolaget L M Ericsson: *See—*
Carlsson, Leif Ronny, 4,101,804, Cl. 315-3.500.

Teletype Corporation: *See—*
Sokolowski, Eugene K., 4,101,018, Cl. 400-582.000.

Tendy Electronics Co.: *See—*
Hajduk, Marian Stanislaw, 4,101,967, Cl. 364-900.000.

Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, to Yoshida Kogyo K.K. Shuttle for ribbon looms. 4,100,943, Cl. 139-201.000.

Terai, Kazuto: *See—*
Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.

Teraoka, Kazuharu; and Nishimura, Kazuo, to Teraoka Seikosho Co., Ltd. Electronic digital display scale with label printer. 4,101,366, Cl. 156-378.000.

Teraoka Seikosho Co., Ltd.: *See—*
Teraoka, Kazuharu; and Nishimura, Kazuo, 4,101,366, Cl. 156-378.000.

Terrill, David B.: *See—*
Shaw, Wilfrid G.; and Terrill, David B., 4,101,448, Cl. 252-437.000.

Terzian, Rouben T.: *See—*
Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., 4,101,619, Cl. 264-156.000.

Tesch, Karl, to Jos. Schneider & Co. Optische Werke. Varifocal camera objective with adjustment-range selection. 4,101,202, Cl. 350-187.000.

Tetrafluor, Inc.: *See—*
Reid, William P., 4,101,140, Cl. 277-165.000.
Texaco Development Corp.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,101,462, Cl. 521-115.000.
Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, 4,101,515, Cl. 252-182.000.
McEntire, Edward E., 4,101,466, Cl. 521-115.000.
McEntire, Edward E., 4,101,470, Cl. 521-118.000.
Texaco Inc.: *See—*
Allen, Joseph C.; and Chien, Sze-Foo, 4,100,967, Cl. 166-68.000.
Bousaid, Issam S., 4,100,966, Cl. 166-273.000.
Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., 4,101,560, Cl. 260-348.290.
Kuntschik, Lawrence F., 4,101,431, Cl. 252-46.700.
Mayer, Edward A., 4,100,758, Cl. 62-54.000.
Mott, George E.; and Seguin, Ronald D., 4,100,753, Cl. 61-86.000.
Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., 4,101,288, Cl. 23-288.00B.
Texas Alkyls, Inc.: *See—*
Malpass, Dennis B.; and Watson, Spencer C., 4,101,568, Cl. 260-448.00A.
Texas Instruments Incorporated: *See—*
Jenne, Richard L., 4,101,861, Cl. 337-368.000.
Kulwicki, Bernard M.; and St.Martin, Norman P., 4,101,454, Cl. 252-514.000.
Orcutt, John W., 4,100,930, Cl. 137-68.00R.
Possley, Glen G.; Massey, Robert G.; and Williams, Billy B., 4,101,350, Cl. 148-175.000.
Shah, Pradeep L.; and Fuller, Clyde R., 4,101,351, Cl. 148-188.000.
Textoris, Melvin A.: *See—*
Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., 4,101,166, Cl. 297-304.000.
Textron Inc.: *See—*
Moertel, George B., 4,100,656, Cl. 24-205.16C.
Monroe, Lawrence S., 4,101,360, Cl. 156-200.000.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
Thatcher, Arthur K.; and McCarter, Ed R. Computer controlled sonic fuel system. 4,100,896, Cl. 123-119.0EE.
Thawley, Clive Stafford; and Shepherd, Thomas, to Uniroyal Limited. Expansion joints. 4,101,150, Cl. 285-226.000.
Thiele, Gary A.: *See—*
Crews, Michael R.; and Thiele, Gary A., 4,101,900, Cl. 343-789.000.
Thom, Karl Friedrich, to Minnesota Mining and Manufacturing Company. Imidazole type curing agents and latent systems containing them. 4,101,514, Cl. 528-109.000.
Thomas, Hector, to Heat Exchangers Africa Limited. Finned tubing. 4,100,784, Cl. 72-98.000.
Thomas, James A.: *See—*
Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., 4,101,950, Cl. 361-203.000.
Thomas, Norman W., to Celanese Corporation. Epoxy-catalyst additive system to produce higher I.V. polybutylene terephthalate from low I.V. polymer. 4,101,601, Cl. 260-836.000.
Thomas, Richard E.; and Pankey, Titus, Jr., to United States of America, Navy. Controlled-porosity dispenser cathode. 4,101,800, Cl. 313-346.0DC.
Thomas, William A., Jr., to Eastman Kodak Company. Yarn tie-up and transfer tail method, and yarn package tube and apparatus for the method. 4,101,086, Cl. 242-18.0PW.
Thomason, Larry V. Continuous concrete pipe laying machine. 4,100,751, Cl. 61-72.200.
Thomson-CSF: *See—*
Rougeot, Henri; and Roziere, Guy, 4,101,770, Cl. 250-363.00S.
Trigon, Roland, 4,101,902, Cl. 343-854.000.
Thufvesson, Kenth Anker: *See—*
Harre, Kurt Johan Stausgaard; and Thufvesson, Kenth Anker, 4,101,087, Cl. 242-84.20A.
Thune, Robert H., to General Motors Corporation. Apparatus for rib trimming of universally molded battery container. 4,100,828, Cl. 83-1.000.
Thurman, Donald W.: *See—*
Broach, George C.; and Thurman, Donald W., 4,101,265, Cl. 432-29.000.
Tiegel Manufacturing Company: *See—*
Tiegel, Ralph G., 4,100,674, Cl. 29-623.500.
Tiegel, Ralph G., to Tiegel Manufacturing Company. Method for making a side terminal weld. 4,100,674, Cl. 29-623.500.
Tielemans, Peter Andreas, Waltherus: *See—*
Kuus, Gijsbert; and Tielemans, Peter Andreas, Waltherus, 4,101,796, Cl. 313-178.000.
Tihanyi, Jenoe; and Hoepfner, Voachim, to Siemens Aktiengesellschaft. Field effect transistor with a short channel length. 4,101,922, Cl. 357-23.000.
Tilby, Sydney E. Methods and apparatus for extracting juices from juice-laden solid materials. 4,101,285, Cl. 23-270.00B.
Tilles, Harry, to Stauffer Chemical Company. Process for increasing the cis content of a mixture of cis and trans isomers of S-isopropyl-1-(5-ethyl-2-methylpiperidinecarbothioate). 4,101,555, Cl. 260-293.850.
Tilton, Richard S.: *See—*
Gikow, Emanuel, deceased; and Tilton, Richard S., 4,101,854, Cl. 333-82.00B.
Time Computer, Inc.: *See—*
Reese, Robert O.; and Garrison, Donald W., 4,101,963, Cl. 364-705.000.
Timour, Sune E.; and Littrell, Thomas D., to Cummins Engine Company, Inc. Isolated oil pan assembly. 4,101,003, Cl. 184-106.000.
Tinney, Francis John: *See—*
Nicolaides, Ernest D.; and Tinney, Francis John, 4,101,537, Cl. 260-112.5LH.
Tippmer, Kurt, to Carl Still, Firma. Method for converting the ammonia and hydrogen sulfide contained in coke-oven gases into nitrogen and water and sulfur respectively. 4,101,642, Cl. 423-573.00G.
Titone, Simone Charles, to Du Pont de Nemours, E. I., and Company. Process and nonraveling knit tubular products having axial stretch. 4,100,770, Cl. 66-193.000.
Toagosei Chemical Industry Co., Ltd.: *See—*
Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, 4,101,493, Cl. 260-29.60R.
Tobias, John W.: *See—*
Taylor, Lynn J.; and Tobias, John W., 4,101,720, Cl. 526-3.000.
Tobin, John H., to Olin Corporation. Catalytic process for the preparation of perfluoroalkyl-substituted heterocyclic compounds. 4,101,554, Cl. 260-290.0HL.
Toda, Gyozo: *See—*
Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.
Toeda, Hiroshi: *See—*
Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,101,841, Cl. 330-254.000.
Tojyo, Tsutomu, to Olympus Optical Co., Ltd. Low magnification microscope objective. 4,101,201, Cl. 350-175.0ML.
Tokai Rika Denki Seisakusho K.K.: *See—*
Sasaki, Shiro; Inukai, Mitsuo; and Tokai Rika Denki Seisakusho K.K., 4,101,171, Cl. 297-389.000.
Tokico Ltd.: *See—*
Ando, Hiromi, 4,100,839, Cl. 91-369.00B.
Tateoka, Kiyoshi; Ando, Hiromi; and Azuma, Tomizo, 4,100,838, Cl. 91-1.000.
Tokura, Yukio: *See—*
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
Tokuyama Soda Kabushiki Kaisha: *See—*
Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, 4,101,395, Cl. 204-98.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Aihara, Mitsuo; Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,101,838, Cl. 328-63.000.
Ishikawa, Keiichi, 4,101,266, Cl. 432-46.000.
Koseki, Isamu; and Seimiya, Motoo, 4,101,309, Cl. 75-0.5AB.
Minami, Hiroshi; Harao, Norio; and Tsuneoka, Takuji, 4,101,766, Cl. 250-320.000.
Murano, Mitsuo, 4,100,764, Cl. 62-289.000.
Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.
Suzuki, Seigo, 4,101,732, Cl. 178-53.10R.
Tomatsuri, Kouichi: *See—*
Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,101,841, Cl. 330-254.000.
Tomita, Tadayoshi: *See—*
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.
Tomy Kogyo Co., Inc.: *See—*
Ogasawara, Toyotsugu, 4,100,696, Cl. 46-40.000.
Tonomura, Shinji: *See—*
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Shipitalo, William M., 4,100,986, Cl. 180-75.000.
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Ueno, Hiroshi; Otsuka, Shinya; Tsukamoto, Tetsuo; and Kishimoto, Akira, 4,101,534, Cl. 260-857.0TW.
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Okano, Masao, 4,101,317, Cl. 75-156.500.
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Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, 4,101,621, Cl. 264-182.000.
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Miyagi, Hideo, 4,100,735, Cl. 60-276.000.
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Butterworth, Arthur L.; and Niedzwiecki, Joseph F., 4,100,934, Cl. 137-512.000.

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Skuran, Victor, 4,100,711, Cl. 52-489.000.

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Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., 4,101,974, Cl. 365-96.000.

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Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, 4,101,072, Cl. 235-455.000.

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Resch, Josef; Matuska, Jan; and Trejtnar, Jindrich, 4,100,945, Cl. 139-291.00C.

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Klopfenstein, King L.; and Connors, Robert H., 4,100,984, Cl. 177-50.000.

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Jennen, Friedrich; and Tricoire, Jean, 4,101,696, Cl. 428-1.000.

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Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, 4,101,976, Cl. 365-119.000.

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Oganesyan, Oganes Vardanovich; and Pyanov, Nikolai Ivanovich, 4,100,919, Cl. 128-84.00B.

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Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.

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Minami, Hiroshi; Harao, Norio; and Tsuneoka, Takuji, 4,101,766, Cl. 250-320.000.

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Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.

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Hammer, Henry H., 4,101,165, Cl. 297-273.000.

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LeMay, Dan B., 4,100,801, Cl. 73-202.000.

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Sage, Howard M.; and Abromavage, John C., 4,101,061, Cl. 224-42.10F.

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Lawson, Nelson E., 4,101,477, Cl. 260-22.0CB.

Union Carbide Corporation: *See*—
Ambrosini, Ronald Frank; Anderson, Richard Alan; Fornoff, Louis Leonard; and Manchanda, Krishan Dayal, 4,101,631, Cl. 423-210.000.
Borchert, Robert Curtis, 4,101,691, Cl. 427-229.000.
Deem, Mary Lease; and Stueben, Kenneth Charles, 4,101,586, Cl. 260-593.00R.
Kelly, William Tolson, III; and Stahl, Francis, 4,101,818, Cl. 320-2.000.
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Levine, Isaac Jacob; and Karol, Frederick John, 4,101,445, Cl. 252-429.00R.
Pelton, John Franklin, 4,100,849, Cl. 100-41.000.
Rosen, Meyer Robert, 4,101,442, Cl. 252-358.000.
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Maly, George P.; and Young, Donald C., 4,101,426, Cl. 252-8.55C.
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Thawley, Clive Stafford; and Shepherd, Thomas, 4,101,150, Cl. 285-226.000.

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Kim, Yang J.; and Williams, Belton R., 4,101,414, Cl. 208-18.000.

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Etherington, Clifford, 4,101,253, Cl. 425-79.000.
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Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 4,100,719, Cl. 53-241.000.
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Baker, Robert A.; and Bruemmer, Joseph H., 4,101,678, Cl. 426-50.000.
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Betts, William L., 4,101,964, Cl. 364-724.000.
Breedlove, Harold W.; and Brown, Walter L., 4,101,824, Cl. 324-20.00R.
Brody, Philip S., 4,101,975, Cl. 365-117.000.
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Harp, James L., Jr., 4,100,742, Cl. 60-602.000.
Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.
Jones, Howard S., Jr., 4,101,895, Cl. 343-708.000.
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Joyce, James W., 4,100,789, Cl. 73-23.000.
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Fasnacht, Floyd A., Jr., 4,100,888, Cl. 122-438.000.
Hooper, Edwin B., Jr., 4,101,765, Cl. 250-251.000.
Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., 4,101,813, Cl. 315-370.000.
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Ballou, E. Vernon; Wood, Peter C.; Wydeven, Theordore J., Jr.; and Spitze, LeRoy A. Process for the preparation of calcium superoxide. 4,101,644, Cl. 423-581.000.
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Jain, Atul. Surface roughness measuring system. 4,101,891, Cl. 343-17.2PC.
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Askins, Barbara S., 4,101,780, Cl. 250-475.000.
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Crews, Michael R.; and Thiele, Gary A., 4,101,900, Cl. 343-789.000.
Hickle, William H., 4,101,098, Cl. 244-63.000.
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Poole, Lynn A.; and Crain, Harry M., 4,101,839, Cl. 328-165.000.
Poulin, Clyde J.; and Bryla, Theodore N., 4,101,352, Cl. 149-19.200.
Thomas, Richard E.; and Pankey, Titus, Jr., 4,101,800, Cl. 313-346.0DC.
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Elzinga, Johannes Mattheus; and Sondern, Albertus Derk, 4,101,774, Cl. 250-402.000.
Hempenius, Klaas; Van Mourik, Jan Cornelis; and Stevens, Petrus Franciscus, 4,101,883, Cl. 340-365.00R.
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,101,908, Cl. 346-139.00C.
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Kuus, Gijsbert; and Tielemans, Peter Andreas, Waltherus, 4,101,796, Cl. 313-178.000.
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Michels, Albertus Peter Johannes, 4,100,741, Cl. 60-517.000.
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Schmedemann, Walter, 4,101,779, Cl. 250-445.00R.
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Cullen, Donald E.; and Reeder, Thomas M., 4,100,811, Cl. 73-654.000.
Feder, Ernest, 4,100,993, Cl. 181-213.000.
Goetsch, Henry E.; Cook, James A.; and Armstrong, Lee R., 4,100,793, Cl. 73-118.000.
Hess, John R.; and Asplund, Herbert Frederick, 4,101,245, Cl. 416-190.000.
Striebel, Edmund Emil; Koblish, Theodore Richard; Madden, Thomas Joseph; and James, Roger Halsted, 4,100,733, Cl. 60-39.74B.
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Miller, John E.; and Postema, James R., 4,101,794, Cl. 310-71.000.
Universal Maschinenfabrik Dr. Rudolf Schieber KG: *See—*
Kuhnert, Gottfried, 4,100,766, Cl. 66-64.000.
Schieber, Hans; and Schimko, Reinhold, 4,100,767, Cl. 66-75.200.
Universal Propulsion Company, Inc.: *See—*
Marion, Frank A., 4,101,291, Cl. 44-17.000.
University of Missouri, The Curators of the: *See—*
Morris, Arthur E., 4,101,314, Cl. 75-77.000.
UOP Inc.: *See—*
Antos, George J., 4,101,418, Cl. 208-139.000.
Hayes, John C.; and Pollitzer, Ernest L., 4,101,593, Cl. 260-666.00A.
Howard, Leroy J., Jr., 4,101,594, Cl. 260-668.00A.
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Lockwood, Robert J.; McLaughlin, Alexander; and Reymore, Harold E., Jr., 4,101,465, Cl. 521-118.000.
Southern, Edward M., 4,100,923, Cl. 128-348.000.
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Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, 4,100,864, Cl. 112-121.110.
Dennstadt, Heinz; and Baum, Walter, 4,100,772, Cl. 69-47.000.
Duffy, Richard J.; and Rodden, Philip J., 4,100,882, Cl. 118-620.000.
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Kamada, Hidemoto; Miura, Chiaki; and Utena, Makoto, 4,101,683, Cl. 426-618.000.
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Kurtz, Ronald A.; and Utzinger, Henry P., 4,101,126, Cl. 273-95.00R.
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Kemper, Yves Jean, 4,100,815, Cl. 74-60.000.
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Bingham, John A. C.; and Maxwell, Ronald K., 4,101,833, Cl. 325-30.000.
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Wornall, William D.; and Valk, Nick, 4,100,651, Cl. 19-145.500.
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Smith, David W.; LeBlanc, Raymond C.; and Oliver, J. Allen, 4,101,100, Cl. 244-114.00R.
Van Benthuysen, John D., to CTS Corporation. Variable resistance slide control. 4,101,864, Cl. 338-183.000.
Van der Stap, Antonius Henricus Maria: *See—*
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Hartmann, Charles Harold, 4,101,278, Cl. 23-232.00C.

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Rietmuller, Karl Heinz, 4,101,954, Cl. 362-26.000.

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Fleissner, Hans, 4,101,270, Cl. 8-17.000.

Vernov, Pavel Alexandrovich: *See—*
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

Vervest, Johannes Cornelis Gerardus: *See—*
van Esdonk, Johannes; Hasker, Jan; and Vervest, Johannes Cornelis Gerardus, 4,101,185, Cl. 316-19.000.

Vial, Jean: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,101,307, Cl. 71-88.000.

Vibra-Metrics, Inc.: *See—*
Shepter, Joseph J., 4,101,816, Cl. 318-130.000.

Vickers Limited: *See—*
Lawson, Leslie Edward, 4,101,322, Cl. 96-33.000.

Victor Company of Japan, Ltd.: *See—*
Shinhara, Kazue, 4,101,936, Cl. 360-10.000.

Vida, Julius A.: *See—*
Samour, Carlos M.; and Vida, Julius A., 4,101,668, Cl. 424-275.000.

Viking Industries, Inc.: *See—*
Jones, Kendall; and Hill, Boyce M., 4,100,629, Cl. 4-295.000.

Vild, Joseph P.: *See—*
Baker, Richard G.; Vild, Joseph P.; Griesfelder, Charles; and Fox, Donald P., 4,101,832, Cl. 324-227.000.

Violini, Nello: *See—*
Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, 4,101,247, Cl. 417-48.000.

Vitrum AB: *See—*
Chang, Stephen S., 4,101,673, Cl. 424-312.000.

Vockenhuber, Karl: *See—*
Freudenschuss, Otto, 4,101,209, Cl. 352-91.00C.

Vogel, Bruce N.: *See—*
Martin, Bernard L.; and Vogel, Bruce N., 4,101,114, Cl. 254-134.3FT.

Vogel, Rudolf. Method and apparatus for installing pipes in off-shore locations. 4,100,754, Cl. 61-98.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Breitfeld, Gunter, 4,101,091, Cl. 242-107.000.
Oehm, Klaus, 4,101,146, Cl. 280-731.000.

von Rauch, Moriz; and Veneklasen, Lee H., to Siemens Aktiengesellschaft. Rod-shaped specimen holder for an optical corpuscular-beam apparatus. 4,101,778, Cl. 250-441.000.

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Klose, Odo; and von Schuckmann, Alfred, 4,100,630, Cl. 5-66.000.

Voronin, Nikolai Georgievich: *See—*
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Voss, Hans Werner; and Kluting, Bernd, to Keiper Automobiltechnik GmbH & Co. KG. Mounting arrangement for an adjustable vehicular seat. 4,101,110, Cl. 248-395.000.

Voss, Klaus: *See—*
Reibetanz, Wilbert; Wanner, Karl; and Voss, Klaus, 4,101,238, Cl. 408-59.000.

Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, to RCA Corporation. Adherence of metal films to polymeric materials. 4,101,402, Cl. 204-192.00C.

Vosters, Rene Maria: *See—*
Noteiteirs, Victor Rosallie; and Vosters, Rene Maria, 4,101,798, Cl. 313-315.000.

Vought Corporation: *See—*
Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., 4,100,808, Cl. 73-588.000.

Vsesohuzny nauchno-issledovatelsku I Proktno-Konstruk torsky institut. Dobychi Uglya Grdravlicheskin Sposobom "Vnllgidrougal": *See—*
Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, 4,101,243, Cl. 415-201.000.

W. R. Grace & Co.: *See—*
Lowther, Frank Eugene, 4,101,296, Cl. 55-33.000.

WABCO Westinghouse: *See—*
Montanari, Piero, 4,101,820, Cl. 323-94.00R.

WABCO Westinghouse GmbH: *See—*
Ruhnau, Gerhard, 4,101,789, Cl. 307-220.00R.

Wacome, Donald M.: *See—*
Lindemann, Martin K.; and Wacome, Donald M., 4,101,492, Cl. 260-29.6NR.

Wade, Jerry D.; and Geisler, Phillip H. Automatic headgate for animals. 4,100,886, Cl. 119-98.000.

Wagner Electric Corporation: *See—*
Atkins, Carl E.; and McGuirk, Francis A., Jr., 4,101,791, Cl. 307-308.000.

Waibel, Gottfried: *See—*
Fottner, Gunther; and Waibel, Gottfried, 4,101,215, Cl. 355-15.000.

Wait, Albert L., Jr. Reel structure. 4,101,090, Cl. 242-96.000.

Walker, Donald A.: *See—*
Hale, William J.; Horst, William R.; and Walker, Donald A., 4,101,905, Cl. 346-74.100.

Walker, John: *See—*
Edwards, Douglas Cameron; and Walker, John, 4,101,434, Cl. 252-52.00R.

Wallace, Harry S.; and Taylor, Robert C., to Hopple Plastics, Inc. Shipping tray for fruit. 4,101,049, Cl. 229-2.50R.

Wallen, Jan, to Ferrolegeringar Trollhatteverken AB. Conversion of molybdenite concentrate to ferro-molybdenum and simultaneous removal of impurities by direct reduction with sulfide forming reducing agents. 4,101,316, Cl. 75-129.000.

Wallin, Jan-Olof, to Irvin Industries, Inc. Device for use in emergency locking mechanism for webbing-type safety belts. 4,101,094, Cl. 242-107.40A.

Walter, Harald: *See—*
Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.

Walter Kidde and Co., Inc.: *See—*
Osborne, William B., 4,101,887, Cl. 340-652.000.

Walton, Edward L.: *See—*
Doss, Richard C.; and Walton, Edward L., 4,101,482, Cl. 260-27.0BB.

Wanner, Karl: *See—*
Reibetanz, Wilbert; Wanner, Karl; and Voss, Klaus, 4,101,238, Cl. 408-59.000.

Wanninkhof, Markus Wilhelm Matthijs; van der Velden, Johnny Wilhelmus; and Broerse, Pieter Hendrik, to U.S. Philips Corporation. Flash array. 4,101,260, Cl. 431-95.00R.

Ward, Daniel. Hoop toy. 4,100,697, Cl. 46-269.000.

Ward, John Wesley; and Leonard, Charles Arthur, to A. H. Robins Company, Incorporated. Method for inhibiting emesis and compositions therefor. 4,101,662, Cl. 424-267.000.

Warner-Lambert: *See—*
Campbell, Alfred, 4,101,538, Cl. 260-112.5LH.
Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, 4,101,661, Cl. 424-266.000.

Warner, Melvin B. "Cy"; and Marshall, Dan H., II. Radio beacon for a nautical emergency rescue system. 4,101,894, Cl. 343-112.00R.

Warrell, Richard D.: *See—*
Johnson, Joseph E., Jr.; and Warrell, Richard D., 4,101,043, Cl. 215-100.00R.

Watanabe, Akinori: *See—*
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.

Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, to Mitsubishi Chemical Industries Limited. Polyester films. 4,101,523, Cl. 528-309.000.

Watanabe, Ryo: *See—*
Matsuno, Yoshiyuki; Kobayashi, Hiroshi; and Watanabe, Ryo, 4,100,872, Cl. 114-73.000.

Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, to Canon Kabushiki Kaisha. Data recording device for camera. 4,101,912, Cl. 354-106.000.

Waterworth, Peter; and Reid, Douglas Charles John, to Plessey Handel und Investments AG. Scanning system. 4,101,193, Cl. 350-6.800.

Watkins, Caesar E., to Inland Container Corporation. Recessed end container. 4,101,022, Cl. 206-45.140.

Watkins, Royston K.: *See—*
Mansfield, Brian A.; and Watkins, Royston K., 4,101,776, Cl. 250-416.0TV.

Watrous, John R.: *See—*
Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., 4,101,723, Cl. 544-360.000.

Watson, Spencer C.: *See—*
Malpass, Dennis B.; and Watson, Spencer C., 4,101,568, Cl. 260-448.00A.

Watson, Susan Steves, to Kay Laboratories, Inc. Method for splicing cables and hot pack for use therein. 4,101,353, Cl. 156-49.000.

Watts, Leonard, to Technicon Instruments Corporation. Method and apparatus for casting metals. 4,100,960, Cl. 164-119.000.

Way, Allan S., to Beckman Instruments, Inc. Apparatus for calibrating an optical null spectrophotometer. 4,101,219, Cl. 356-89.000.

Wayment, William Ross, to Joy Manufacturing Company. Method of mine backfilling and material therefor. 4,101,333, Cl. 106-85.000.

Weathershields Limited: *See*—
Currall, John Josiah, 4,101,161, Cl. 296-137.00H.

Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, to Singer Company, The. Data-gathering device for scanning data having a variable amplitude modulation and signal to noise ratio. 4,101,072, Cl. 235-455.000.

Webster, John David; Wilkinson, Anthony Austin; and Tucker, Frederick George, to English Clays Lovering Pochin & Co. Ltd. Method of lining pipes. 4,101,623, Cl. 264-270.000.

Webster, Norman William Fletcher: *See*—
Fitzmaurice, Colin; and Webster, Norman William Fletcher, 4,101,567, Cl. 260-438.50R.

Wedel, Carroll J., to Chevron Research Company. Polyolefin photostabilizer composition. 4,101,479, Cl. 260-23.00H.

Wehr Corporation: *See*—
Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., 4,100,938, Cl. 137-625.310.

Weiberg, Otto: *See*—
Kruger, Manfred; Schreyer, Gerd; and Weiberg, Otto, 4,101,570, Cl. 260-502.00R.

Weibull, Torsten Waloddi. Connection device. 4,101,229, Cl. 403-171.000.

Weigele, Manfred: *See*—
Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.

Weigl, John Wolfgang; and Mammino, Joseph, to Xerox Corporation. Magnetographic imaging member and the method of its use. 4,101,904, Cl. 346-74.100.

Weiler, David William: *See*—
Kirkpatrick, Robert Duncan; and Weiler, David William, 4,101,610, Cl. 261-110.000.

Weimann, Gunter: *See*—
Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.

Weinstein, Barry: *See*—
Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, 4,100,732, Cl. 60-39.360.

Weisbach, Jerry A.: *See*—
DeMarinis, Robert M.; and Weisbach, Jerry A., 4,101,657, Cl. 424-246.000.

Weist, Walter R.: *See*—
Scott, John H.; and Weist, Walter R., 4,100,877, Cl. 115-11.000.

Welch, Cletus N.: *See*—
Johnson, Harlan B.; Martinsons, Aleksandrs; and Welch, Cletus N., 4,101,624, Cl. 264-273.000.

Wells, Frank M.; and Black, Gordon J., to Ameron, Inc. Method of casting beveled pipe. 4,101,622, Cl. 264-251.000.

Wells, Robert C.: *See*—
Clancy, John J.; and Wells, Robert C., 4,100,853, Cl. 101-401.100.

Weman, Per Olof: *See*—
Schmelow, Harald Martin; Weman, Per Olof; and Arff, Heino, 4,101,092, Cl. 242-107.40B.

Wengeler, Wilhelm: *See*—
Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, 4,101,384, Cl. 195-142.000.

Werthemann, Lucius: *See*—
Burckhardt, Urs; Werthemann, Lucius; and Troxler, Richard Josef, 4,101,585, Cl. 260-592.000.

Westerlund, G. Oscar, to Gow Enterprises Limited. Simplified electrolytic system. 4,101,406, Cl. 204-239.000.

Western Electric Co., Inc.: *See*—
Corsaro, Vincent A.; and Gutbier, Ernst A., 4,101,066, Cl. 228-180.00R.

Western Gear Corporation: *See*—
Peirce, Allen E.; Obear, Robert F.; and Olson, David E., 4,100,700, Cl. 51-92.00R.

Westinghouse Electric Corp.: *See*—
Duncan, Robert, 4,101,752, Cl. 219-91.200.
Heim, Richard C., 4,100,926, Cl. 134-64.00R.
Hickam, William M., 4,101,277, Cl. 23-232.00R.
Lloyd, Wayne B., 4,101,102, Cl. 248-20.000.
Meyer, Jeffry R.; and Hess, Robert L., 4,101,748, Cl. 200-148.00A.
Shoupp, William E.; and Bratkowski, Walter V., 4,101,792, Cl. 310-15.000.

Weyerhaeuser Company: *See*—
Hansenwinkle, Earl Dean; Kuanoni, Clement; and Wislocker, Frank, 4,101,372, Cl. 156-580.000.

Whalin, Jeffery Alden: *See*—
Dworsky, Lawrence Noah; and Whalin, Jeffery Alden, 4,101,850, Cl. 333-24.200.

Whang, Tack J.; and Pelz, Robert W., to Reichhold Chemicals, Inc. Low modules glass fibers and laminate reinforced with same. 4,101,709, Cl. 428-433.000.

Wheelock Signals, Inc.: *See*—
Haus, Rein, 4,101,880, Cl. 340-326.000.

Whirlpool Corporation: *See*—
Doner, John T., 4,101,750, Cl. 219-10.55C.
Linstromberg, William John; and Rutledge, Charles Thomas, 4,100,761, Cl. 62-137.000.

Whitaker, Donald Edward, to International Telephone and Telegraph Corporation. Electronic DX signaling circuit. 4,101,733, Cl. 178-58.00R.

White, J. Craig: *See*—
Churchill, Geoffrey B.; and White, J. Craig, 4,101,702, Cl. 428-213.000.

White, John A. Adverse conditioning system. 4,100,706, Cl. 52-101.000.

White, Robert Charles, to Ontario Research Foundation. Wrist implant apparatus. 4,100,626, Cl. 3-1.910.

White, Roger L.; and Dalton, Richard K., to E & E Specialties, Inc. Mold for forming a plastic article having an undercut or negative draft portion. 4,101,256, Cl. 425-441.000.

Whitlow, William T.: *See*—
Brejnik, Carl; and Whitlow, William T., 4,101,071, Cl. 235-92.0MT.

Whittam, Thomas Vincent; and Youll, Barry, to Imperial Chemical Industries Limited. Isomerization of alkyl benzenes using a nu-l zeolite catalyst. 4,101,598, Cl. 260-668.00A.

Wicklund, Michael M. Safety cartridge indicator for guns. 4,100,691, Cl. 42-1.00D.

Wickman Machine Tool Sales Limited: *See*—
McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, 4,100,825, Cl. 82-3.000.

Wiedijk, Piet; Schmitz, Johannes Hubertus Antonius; and Van der Stap, Antonius Henricus Maria, to U.S. Philips Corporation. High-pressure gas discharge lamp. 4,101,799, Cl. 313-331.000.

Wienand, Michael; and Juch, Ernst, to Dynamit Nobel Aktiengesellschaft. Antistatic and/or electrically conductive floor covering, as well as process for the production thereof. 4,101,689, Cl. 427-122.000.

Wiggin, Joseph F., to Harris Corporation. Video preamplifier for camera operated in act mode. 4,101,932, Cl. 358-223.000.

Wiik, Tor. Method for manufacturing thermoplastic articles. 4,101,628, Cl. 264-325.000.

Wilkinson, Anthony Austin: *See*—
Webster, John David; Wilkinson, Anthony Austin; and Tucker, Frederick George, 4,101,623, Cl. 264-270.000.

Wilkinson, Brendan Michael; and Belfiore, Erasmo, to Gardner-Denver Company. Drill cuttings separation and control apparatus. 4,100,982, Cl. 175-206.000.

William H. Rorer, Inc.: *See*—
Diamond, Julius, 4,101,591, Cl. 260-649.00F.

William Printz Company, Inc.: *See*—
Harvey, Gerald J., 4,100,790, Cl. 73-23.100.

Williams, Belton R.: *See*—
Kim, Yang J.; and Williams, Belton R., 4,101,414, Cl. 208-18.000.

Williams, Billy B.: *See*—
Possley, Glen G.; Massey, Robert G.; and Williams, Billy B., 4,101,350, Cl. 148-175.000.

Williams, Charles R.: *See*—
Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., 4,101,485, Cl. 260-29.4UA.

Williams, David E., to Amark Industries, Inc. Nebulizer. 4,101,611, Cl. 261-142.000.

Williams, Elmer A., to Rockwell International Corporation. Electronic fuel injection control system. 4,100,891, Cl. 123-32.0EB.

Williams, Norman E.: *See*—
Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.

Williams, Philip J.: *See*—
Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., 4,101,166, Cl. 297-304.000.

Williams, Salvion Ed. Solar energy collector. 4,100,914, Cl. 126-270.000.

Willis, Donald Henry, to RCA Corporation. Horizontal deflection circuit with high voltage selection capability. 4,101,815, Cl. 315-411.000.

Wilson, George A., to Gould Inc. Circuit breaker racking mechanism for drawout type switchgear. 4,101,744, Cl. 200-50.0AA.

Wiltshire, Arthur J., to Structural Fibers, Inc. Preform machine. 4,101,254, Cl. 425-82.100.

Wincent, Karl Tommy: *See*—
Englund, Gosta Roland; and Wincent, Karl Tommy, 4,101,017, Cl. 400-124.000.

Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, to Hergeth KG Muschinenfabrik und Apparatebann. Adjustable feed plate. 4,100,650, Cl. 19-105.000.

Wirz, Arno: *See*—
Jeschke, Willi; and Wirz, Arno, 4,101,122, Cl. 271-277.000.

Wisconsin Alumni Research Foundation: *See*—
Rasmussen, Don H.; and Loper, Carl R., Jr., 4,101,310, Cl. 75-0.50B.
Rich, Daniel H.; and Gurwara, Sweet K., 4,101,721, Cl. 526-19.000.

Wise, John J.: *See*—
Mitchell, Kenneth M.; and Wise, John J., 4,101,596, Cl. 260-668.00A.

Wislocker, Frank: *See*—
Hansenwinkle, Earl Dean; Kuanoni, Clement; and Wislocker, Frank, 4,101,372, Cl. 156-580.000.

Witteck, Fritz: *See*—
Dorp, Walter Vom; Ritter, Hans Georg; and Witteck, Fritz, 4,100,786, Cl. 72-252.000.

Wobaco Trust, Ltd. Trustee: *See*—
Kent, Jerry B.; and Augostini, Peter P., 4,101,494, Cl. 260-29.60B.

Wohlhaupter, Gerhard, to Emil Wohlhaupter u. Co. Boring tool provided with a pair of separately adjustable cutters. 4,101,239, Cl. 408-182.000.

Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.;

and Otte, Dieter W., to Broan Manufacturing Co., Inc. Drive mechanism for trash compactors. 4,100,850, Cl. 100-287.000.

Wolff, Douglas F.: *See—*
Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., 4,101,059, Cl. 223-85.000.

Wolkowicz, Richard I., to Sun Chemical Corporation. Strapping tapes. 4,101,706, Cl. 428-294.000.

Wolosky, Irwin S.: *See—*
Morgan, Donald F.; and Wolosky, Irwin S., 4,101,463, Cl. 260-2.300.

Wood, Peter C.: *See—*
United States of America, National Aeronautics and Space Administration; Ballou, E. Vernon; Wood, Peter C.; Wydeven, Theordore J., Jr.; and Spitze, LeRoy A., 4,101,644, Cl. 423-581.000.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 4,101,069, Cl. 229-40.000.

Woolbright, Marc Anthony Cantil. Herb cleaner record cover. 4,101,028, Cl. 206-311.000.

Woollard, Gary A., to Borg-Warner Corporation. Drive system. 4,100,818, Cl. 74-230.17E.

Workman, John. Moulding process for metals. 4,100,958, Cl. 164-7.000.

Wornall, William D.; and Valk, Nick, to Aldrich Machine Works. Apparatus and method for removing and blending fibers from a plurality of fiber bales. 4,100,651, Cl. 19-145.500.

Wray, Gordon Richard; and Parry, Ruth Mary, to National Research Development Corporation. Six-box linkage mechanism. 4,100,814, Cl. 74-43.000.

Wright, Delatte U. Flap rudder. 4,100,874, Cl. 114-162.000.

Wyatt, James Bartlett: *See—*
Van Dyck, Kenneth Arthur; Wyatt, James Bartlett; Stephenson, Charles Francis; and Miller, Scott William, 4,101,757, Cl. 219-225.000.

Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., to Science Spectrum, Inc. Process for testing microparticle response to its environment. 4,101,383, Cl. 195-103.50R.

Wydeven, Theordore J., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Ballou, E. Vernon; Wood, Peter C.; Wydeven, Theordore J., Jr.; and Spitze, LeRoy A., 4,101,644, Cl. 423-581.000.

Xerox Corporation: *See—*
Baker, Lamar T., 4,101,788, Cl. 307-205.000.
Fisli, Tibor, 4,101,365, Cl. 156-294.000.
Frey, Thomas M., 4,101,943, Cl. 360-84.000.
Hill, Howard M., 4,101,807, Cl. 315-116.000.
Jacques, James O., 4,101,942, Cl. 360-77.000.
Laskowski, Kenneth W.; and Steiner, Edward L., 4,101,213, Cl. 355-5.000.
Levy, Mortimer; and Goffe, William L., 4,101,321, Cl. 96-1.50R.
Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., 4,101,267, Cl. 432-60.000.
Sellers, Edward C.; and Malkani, Chandler, 4,101,320, Cl. 96-1.400.
Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.
Weigl, John Wolfgang; and Mammino, Joseph, 4,101,904, Cl. 346-74.100.

Yaggy, Leon S., to Hughes Aircraft Company. Silicon diode array vidicon with electronically controlled sensitivity. 4,101,931, Cl. 358-217.000.

Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, to Nippon Chemiphar Co., Ltd. Benzo[b,f]thiepin derivatives. 4,101,667, Cl. 424-275.000.

Yamada, Hideo: *See—*
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Yamada, Takashi: *See—*
Ebihara, Heichachiro; and Yamada, Takashi, 4,101,790, Cl. 307-221.00C.

Yamaguchi, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Packing box. 4,101,034, Cl. 206-612.000.

Yamaguchi, Jiro: *See—*
Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.

Yamaguchi, Tamikazu, to Minolta Camera Kabushiki Kaisha. Gauss type lens system. 4,101,203, Cl. 350-217.000.

Yamaguchi, Tetsuo: *See—*
Aihara, Mitsuo; Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,101,838, Cl. 328-63.000.

Yamaguchi, Yoshinobu: *See—*
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.

Yamamichi, Yoshikazu: *See—*
Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, 4,101,286, Cl. 23-283.000.

Yamamoto, Iwao; and Koga, Moriro, to said Iwao Yamamoto; by said Moriro Koga, a part interest. Off center electrode spark plug. 4,101,797, Cl. 313-141.000.

Yamamoto, Ryuji: *See—*
Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, 4,101,621, Cl. 264-182.000.

Yamamoto, Shunji: *See—*
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.

Yamamoto, Syunichi: *See—*
Nambu, Masao; Yamamoto, Syunichi; and Koiwai, Yoshihisa, 4,101,635, Cl. 423-242.000.

Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, to Kanebo, Ltd. Method for producing flame resistant acrylic fibers. 4,101,621, Cl. 264-182.000.

Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, to Daiichi Seiyaku Co., Ltd. Muramyldipeptide derivatives and process for the preparation thereof. 4,101,536, Cl. 260-112.50R.

Yamanaka, Toru: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.

Yamano, Jiichi. Electrically heated curling iron and stand therefor. 4,101,756, Cl. 219-222.000.

Yamashita, Kazutaka: *See—*
Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,101,518, Cl. 528-100.000.

Yamashita, Maki; and Kogure, Yasuzi, to Minolta Camera Kabushiki Kaisha. Indicating devices for use in cameras. 4,101,914, Cl. 354-128.000.

Yamashita, Shiro, to Kabushiki Kaisha Daini Seikosha. Oscillator. 4,101,848, Cl. 331-116.00R.

Yano, Akikazu: *See—*
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.

Yano, Robert A.: *See—*
Trumbull, Harold E.; Davis, Howard C.; and Yano, Robert A., 4,100,743, Cl. 60-639.000.

Yatabe, Kenichi. Metal bracket for use in orthodontic treatment. 4,100,678, Cl. 32-14.00A.

Yeakey, Ernest Leon: *See—*
Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, 4,101,515, Cl. 252-182.000.

Yearsley, Norman: *See—*
McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, 4,100,825, Cl. 82-3.000.

Yellen, Robert. Practice tennis device. 4,101,128, Cl. 273-106.00A.

Yevick, George J., to Izon Corporation. Fiber optic system. 4,101,188, Cl. 350-96.240.

Yoo, Jin S.: *See—*
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.

Yoshida Kogyo K.K.: *See—*
Oogami, Eiryo, 4,100,704, Cl. 52-65.000.
Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, 4,100,943, Cl. 139-201.000.

Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, to Shionogi & Co., Ltd. Antibacterial hydrazono cephalosporins. 4,101,658, Cl. 424-246.000.

Yoshioka, Yoshiaki: *See—*
Konishi, Fumiya; Kusao, Kenji; and Yoshioka, Yoshiaki, 4,101,772, Cl. 250-399.000.

Yoshizawa, Shigeru: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
Saito, Nobuo; Yoshizawa, Shigeru; and Toyooka, Takashi, 4,101,970, Cl. 365-2.000.

Youll, Barry: *See—*
Whittam, Thomas Vincent; and Youll, Barry, 4,101,598, Cl. 260-668.00A.

Young, Donald C.; and Maly, George P., to Union Oil Company of California. Non-aqueous acid emulsion composition and method for acid-treating siliceous geological formations. 4,101,425, Cl. 252-8.55C.

Young, Donald C.: *See—*
Maly, George P.; and Young, Donald C., 4,101,426, Cl. 252-8.55C.

Young, Jerry W.: *See—*
Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.

Yulga, Julius J.: *See—*
Anderson, William B.; and Yulga, Julius J., 4,101,180, Cl. 308-20.000.

Yursis, Paul J.: *See—*
Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., 4,101,132, Cl. 273-29.00A.

Zahler, Rueben: *See—*
Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., 4,100,938, Cl. 137-625.310.

Zahn, Wolfgang: *See—*
Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, 4,101,217, Cl. 355-38.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao, 4,101,650, Cl. 424-44.000.

Zanella, Dominic A.: *See—*
Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., 4,101,544, Cl. 260-207.100.

Zapart, Bruno J. Fast grind fixture. 4,100,702, Cl. 51-216.00H.

Zawacki, Joseph H.; and Dutton, John P., to Lear Siegler, Inc. Axle spindle forming method. 4,100,781, Cl. 72-41.000.

Zeller, Hans Georg: *See—*
Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, 4,100,897, Cl. 123-119.0EC.

Zenger, Alfred John: *See*—
Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
Zenith Radio Corporation: *See*—
Retsky, Michael Walter; and Schwartz, James W., 4,101,803, Cl. 315-3.000.
Zettwoog, Pierre: *See*—
Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, 4,100,806, Cl. 73-421.50A.
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich. Method of dimerization of alpha-olefins. 4,101,600, Cl. 260-683.15D.
Ziemba, Richard Thomas, to General Electric Company. Fuze encoder. 4,100,856, Cl. 102-206.000.
Zillessen, Christoph: *See*—
Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
Ziselman, Boris Georgievich: *See*—
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Zon, Louis: *See*—
Dieffenbach, Percy; and Zon, Louis, 4,101,697, Cl. 428-9.000.
Zucchinelli, Mario: *See*—
Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, 4,101,247, Cl. 417-48.000.
Zucker, Jerry, to Hudson Pulp & Paper Corp. Method and apparatus for recovering saponified tall oil. 4,101,535, Cl. 260-97.700.
Zugenbuhler, Verne L.: *See*—
Talge, Henry J.; McNair, Samuel L.; and Zugenbuhler, Verne L., 4,100,917, Cl. 128-66.000.
Zywietz, Walter: *See*—
Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
105: *See*—
Fleischer, Henry; and 105, 4,101,149, Cl. 285-55.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., to Standard Forge and Axle Co. Method of casting brake shoes. Re. 29,704, Cl. 164-131.000.

Compere, Newton L. Rupturable blister pill package with safety backing. Re. 29,705, Cl. 206-531.000.

Fatt, Irving, to University of California, The Regents of The. Non-invasively measuring arterial oxygen tension. Re. 29,703, Cl. 128-2.00E.

Gifford, Bruce M.: *See*—
Owen, A. B.; and Gifford, Bruce M., Re. 29,702, Cl. 29-520.000.

KcKinney, Hunter R.: *See*—
Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., Re. 29,704, Cl. 164-131.000.

Lamons Metal Gasket Company: *See*—
Owen, A. B.; and Gifford, Bruce M., Re. 29,702, Cl. 29-520.000.

McKenzie, Roland W.: *See*—
Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., Re. 29,704, Cl. 164-131.000.

Owen, A. B.; and Gifford, Bruce M., to Lamons Metal Gasket Company. Spiral wound gasket assembly method. Re. 29,702, Cl. 29-520.000.

Standard Forge and Axle Co.: *See*—
Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., Re. 29,704, Cl. 164-131.000.

University of California, The Regents of The: *See*—
Fatt, Irving, Re. 29,703, Cl. 128-2.00E.

LIST OF PLANT PATENTEES

McGredy, Samuel D. Rose plant. 4,281, 7-18-78, Cl. 12.000.

Pan-American Plant Company: *See*—
Shoesmith, Leonard H., 4,280, Cl. 77.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum plant. 4,280, 7-18-78, Cl. 77.000.

Weeks, O. L. Rose plant. 4,282, 7-18-78, Cl. 18.000.

LIST OF DESIGN PATENTEES

Absher, Charles A. Tractor pan. 248,558, 7-18-78, Cl. D15-32.000.

Airway Industries, Inc.: *See*—
Davis, Michael, 248,539, Cl. D8-336.000.

Anchor Hocking Corporation: *See*—
Benes, Frank J., 248,526, Cl. D7-1.000.

Antonio Nova S.r.l.: *See*—
Nova, Oscar; and Nova, Renzo, 248,512, Cl. D2-272.000.

Assmann G.m.b.H.: *See*—
Schulze-Bahr, Werner; and Weis, Karl, 248,552, Cl. D14-3.000.

Backstrom, Olof Fredrik; and Linden, Erkki Olavi. Pruning-shears. 248,534, 7-18-78, Cl. D8-5.000.

Baker, Roy L. Combined gun holster and cartridge loops. 248,563, 7-18-78, Cl. D22-13.000.

Ball, Richard: *See*—
Bleiweiss, Arthur A.; and Ball, Richard, 248,590, Cl. D48-32.00A.

Beitler, Myron; and Leer, Stuart D., to Litton Business Systems, Inc. Portable calculating machine. 248,595, 7-18-78, Cl. D64-11.00B.

Benes, Frank J., to Anchor Hocking Corporation. Serving dish or similar article. 248,526, 7-18-78, Cl. D7-1.000.

Berkley & Company, Inc.: *See*—
Oberg, Gary R., 248,541, Cl. D8-372.000.

Bleiweiss, Arthur A.; and Ball, Richard, to Dominion Auto Accessories Limited. Multi-function lens. 248,590, 7-18-78, Cl. D48-32.00A.

Bleiweiss, Arthur F.: *See*—
Urbanek, Karel; and Bleiweiss, Arthur F., 248,592, Cl. D48-32.00R.

Bryk, Charles S., to Texasgulf Inc. Glass mug. 248,527, 7-18-78, Cl. D7-9.000.

Byrne, David S., to Warner-Lambert Company. Razor handle. 248,577, 7-18-78, Cl. D28-48.000.

Byrne, David S., to Warner-Lambert Company. Razor handle. 248,578, 7-18-78, Cl. D28-48.000.

Combi Co. Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,586, Cl. D34-15.00C.

Corda, Charles Richard. Chair. 248,522, 7-18-78, Cl. D6-72.000.

Dart Industries Inc.: *See*—
Haynes, Rodney R., Sr., 248,520, Cl. D6-63.000.
Haynes, Rodney R., Sr., 248,521, Cl. D6-63.000.

Davis, Michael, to Airway Industries, Inc. Combined closure flap and lock for luggage or the like. 248,539, 7-18-78, Cl. D8-336.000.

Deering, Hartland W., Jr., to Minnesota Mining and Manufacturing Company. Tape dispenser. 248,561, 7-18-78, Cl. D19-69.000.

Dibenedetto, Luigi, to TRW Data Systems. Combined security access gate and controlling card reader therefor. 248,555, 7-18-78, Cl. D14-49.000.

Doi, Sinichiro: *See*—
Sekido, Iwae; and Doi, Sinichiro, 248,551, Cl. D12-211.000.

Doman, Donald W., to Kohler Co. Spout. 248,564, 7-18-78, Cl. D23-32.000.

Domasin, Richard. Plumbing and landscaping tool for installing and removing sprinkler heads. 248,536, 7-18-78, Cl. D8-21.000.

Dominion Auto Accessories Limited: *See*—
Bleiweiss, Arthur A.; and Ball, Richard, 248,590, Cl. D48-32.00A.
Urbanek, Karel, 248,591, Cl. D48-32.00A.
Urbanek, Karel; and Bleiweiss, Arthur F., 248,592, Cl. D48-32.00R.

Eckel, David S.; and Lechter, George S. Mirror. 248,525, 7-18-78, Cl. D6-237.000.

Esselte Obergs AB: *See*—
Winther, Ole, 248,517, Cl. D6-3.000.

Fagersta Secoroc AB: *See*—
Sjostrom, Arne; and Svanstrom, Alf, 248,535, Cl. D8-14.000.

Fernando, Fontana, to Fontana Fernando S.p.A. Combined wrist watch case and band. 248,547, 7-18-78, Cl. D10-32.000.

Finch, Lloyd J. Stool. 248,519, 7-18-78, Cl. D6-32.000.

Fontana Fernando S.p.A.: *See*—
Fernando, Fontana, 248,547, Cl. D10-32.000.

Fukuoka, Tatsuo. Shoe. 248,511, 7-18-78, Cl. D2-269.000.

Funahashi, Takaji. Felt pen. 248,560, 7-18-78, Cl. D19-43.000.

Gabourie, Gregory S., to Global Upholstery Company Limited. Seating unit for a swivel chair. 248,524, 7-18-78, Cl. D6-197.000.

Global Upholstery Company Limited: *See*—
Gabourie, Gregory S., 248,524, Cl. D6-197.000.

Gobin, Donald L.; and Scanland, Joseph E., to Roper Corporation. Cutter pin for mower. 248,557, 7-18-78, Cl. D15-17.000.

Goldstein, Morton I. Portable reading table for books. 248,523, 7-18-78, Cl. D6-184.000.

Gorke, Ronald R., to Medtronic, Inc. Telephone electrocardiogram transmitting equipment case. 248,566, 7-18-78, Cl. D24-8.000.

Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, to Matsushita Electric Works, Ltd. Electric shaver. 248,579, 7-18-78, Cl. D28-49.000.

Graham, Roger. Smoking device. 248,572, 7-18-78, Cl. D27-03.000.

Graham, Roger. Smoking device. 248,573, 7-18-78, Cl. D27-03.000.

Graham, Roger. Bowl for a smoking device. 248,574, 7-18-78, Cl. D27-05.000.

Hawkins, Richard T. Data terminal. 248,554, 7-18-78, Cl. D14-43.000.

Haynes, Rodney R., Sr., to Dart Industries Inc. Sofa. 248,520, 7-18-78, Cl. D6-63.000.

Haynes, Rodney R., Sr., to Dart Industries Inc. Curved sofa. 248,521, 7-18-78, Cl. D6-63.000.

Herbst, Lewis R. Prefabricated sound barrier wall. 248,571, 7-18-78, Cl. D25-38.000.

Huff, Edward F. Child's swing. 248,518, 7-18-78, Cl. D6-10.000.

Ichikawa, Kuniharu: *See*—
Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.

Interlego A.G.: *See*—
Tapdrup, Erik Peter, 248,582, Cl. D34-4.00R.

Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,586, Cl. D34-15.00C.

Ismach, Aaron. Animal intradermal nozzle for jet injection device. 248,568, 7-18-78, Cl. D24-25.000.

Jacobs, Jack Z. Bottle design. 248,542, 7-18-78, Cl. D9-23.000.

Janssens, Wilhelmus Gerardus Elisabeth, to U.S. Philips Corporation. Hair dryer. 248,575, 7-18-78, Cl. D28-12.000.

Janssens, Wilhelmus Gerardus Elisabeth, to U.S. Philips Corporation. Hair dryer casing. 248,576, 7-18-78, Cl. D28-12.000.

Johansson, Karl Hugo. Invertible chair. 248,516, 7-18-78, Cl. D6-3.000.

Jung Li Hsing Industry Co., Ltd.: *See*—
Lu, Wan Chan, 248,514, Cl. D2-311.000.

Kidde Consumer Durables Corp.: *See*—
Oster, Joseph, 248,593, Cl. D48-33.000.

Kohler Co.: *See*—
Doman, Donald W., 248,564, Cl. D23-32.000.

LaPolice, George Donald, to Singer Company, The. Sewing machine. 248,559, 7-18-78, Cl. D15-69.000.

Lea, Melvin A., to Oneida Ltd. Spoon or similar article. 248,532, 7-18-78, Cl. D7-137.000.

Lea, Melvin A., to Oneida Ltd. Spoon or similar article. 248,533, 7-18-78, Cl. D7-151.000.

Lechter, George S.: *See*—
Eckel, David S.; and Lechter, George S., 248,525, Cl. D6-237.000.

Leer, Stuart D.: *See*—
Beitler, Myron; and Leer, Stuart D., 248,595, Cl. D64-11.00B.

Lewis, Cecil. Fishing lure. 248,562, 7-18-78, Cl. D22-28.000.

Lincoln, Launa J. Pendulum game device. 248,585, 7-18-78, Cl. D34-15.00P.

Linden, Erkki Olavi: *See*—
Backstrom, Olof Fredrik; and Linden, Erkki Olavi, 248,534, Cl. D8-5.000.

Linder, Peter J. Padlock protector. 248,540, 7-18-78, Cl. D8-346.000.

Litton Business Systems, Inc.: *See*—
Beitler, Myron; and Leer, Stuart D., 248,595, Cl. D64-11.00B.

Lopez, Vincent G. Medical instrument basket apparatus. 248,549, 7-18-78, Cl. D12-29.000.

Lu, Wan Chan, to Jung Li Hsing Industry Co., Ltd. Athletic shoe. 248,514, 7-18-78, Cl. D2-311.000.

Luttrell, Jabe Roy; and Rhine, Edward Vincent. Mailbox. 248,580, 7-18-78, Cl. D31-24.000.

Madl, Alfred W., to Sunbeam Corporation. Massager. 248,569, 7-18-78, Cl. D24-41.000.

Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 248,528, 7-18-78, Cl. D7-137.000.

Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 248,529, 7-18-78, Cl. D7-137.000.

Matsuda, Hiroaki: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,586, Cl. D34-15.00C.

Matsushita Electric Works, Ltd.: *See*—
Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.

Medtronic, Inc.: *See*—
Gorke, Ronald R., 248,566, Cl. D24-8.000.

Minnesota Mining and Manufacturing Company: *See*—
Deering, Hartland W., Jr., 248,561, Cl. D19-69.000.

Montague, Archer Allen, Jr. Applique or the like. 248,588, 7-18-78, Cl. D33-9.00C.

Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co. Ltd. Toy music box. 248,586, 7-18-78, Cl. D34-15.00C.

National Steel Corporation: *See*—
Saunders, William T., 248,544, Cl. D9-216.000.

Nova, Oscar; and Nova, Renzo, to Antonio Nova S.r.l. Boot. 248,512, 7-18-78, Cl. D2-272.000.

Nova, Renzo: *See*—
Nova, Oscar; and Nova, Renzo, 248,512, Cl. D2-272.000.

Oberg, Gary R., to Berkley & Company, Inc. Hook for hanging meat. 248,541, 7-18-78, Cl. D8-372.000.

Olson, Robert T. Key hanger. 248,515, 7-18-78, Cl. D2-400.000.

Oneida Ltd.: *See*—
Lea, Melvin A., 248,532, Cl. D7-137.000.
Lea, Melvin A., 248,533, Cl. D7-151.000.
Manderfield, Ellen B., 248,528, Cl. D7-137.000.
Manderfield, Ellen B., 248,529, Cl. D7-137.000.
Richmond, Colin B., II, 248,530, Cl. D7-137.000.
Richmond, Colin B., II, 248,531, Cl. D7-137.000.

Oster, Joseph, to Kidde Consumer Durables Corp. Fluorescent light bulb. 248,593, 7-18-78, Cl. D48-33.000.

Pacific Handy Cutter, Inc.: *See*—
Richards, James L., 248,538, Cl. D8-99.000.

Parker Pen Company, The: *See*—
Streicheck, Steven G., 248,543, Cl. D9-171.000.

Powell, Ronald. Toy animal figure. 248,581, 7-18-78, Cl. D34-2.00R.

Quaker Oats Company, The: *See*—
Snyder, Paul D., 248,584, Cl. D34-15.00R.

Rebert, James F.; and Rebert, John W. Low console tape deck player. 248,553, 7-18-78, Cl. D14-5.000.

Rebert, John W.: *See*—
Rebert, James F.; and Rebert, John W., 248,553, Cl. D14-5.000.

Rhine, Edward Vincent: *See*—
Luttrell, Jabe Roy; and Rhine, Edward Vincent, 248,580, Cl. D31-24.000.

Richards, James L., to Pacific Handy Cutter, Inc. Adjustable blade knife. 248,538, 7-18-78, Cl. D8-99.000.

Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 248,530, 7-18-78, Cl. D7-137.000.

Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 248,531, 7-18-78, Cl. D7-137.000.

Rieke Corporation: *See*—
Summers, Kenneth L., 248,545, Cl. D9-254.000.

Roper Corporation: *See*—
Gobin, Donald L.; and Scanland, Joseph E., 248,557, Cl. D15-17.000.

Rumbaugh, James T. Water ski rope handle. 248,587, 7-18-78, Cl. D34-41.000.

S/V Tool Company, Inc.: *See*—
Smith, Lloyd T., 248,537, Cl. D8-82.000.

Saunders, William T., to National Steel Corporation. Seam-free can. 248,544, 7-18-78, Cl. D9-216.000.

Scanland, Joseph E.: *See*—
Gobin, Donald L.; and Scanland, Joseph E., 248,557, Cl. D15-17.000.

Schulze-Bahr, Werner; and Weis, Karl, to Assmann G.m.b.H. Miniature dictating machine. 248,552, 7-18-78, Cl. D14-3.000.

Sekido, Iwae; and Doi, Sinichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha (Toyota Motor Co., Ltd.). Wheel. 248,551, 7-18-78, Cl. D12-211.000.

Siefer, Bernard Stuart: *See*—
Smith, Judson L.; and Siefer, Bernard Stuart, 248,570, Cl. D25-31.000.

Siegel, Owen R. Tennis player figurine. 248,548, 7-18-78, Cl. D11-160.000.

Singer Company, The: *See*—
LaPolice, George Donald, 248,559, Cl. D15-69.000.

Sjostrom, Arne; and Svanstrom, Alf, to Fagersta Secoroc AB. Lifting and handling tool for rotary roller bits. 248,535, 7-18-78, Cl. D8-14.000.

Smith, Judson L.; and Siefer, Bernard Stuart, to Smith, Judson L. Car wash building. 248,570, 7-18-78, Cl. D25-31.000.

Smith, Lloyd T., to S/V Tool Company, Inc. Screwdriver. 248,537, 7-18-78, Cl. D8-82.000.

Snyder, Paul D., to Quaker Oats Company, The. Educational block toy. 248,584, 7-18-78, Cl. D34-15.00R.

Snyder, Richard D. Aircraft clock. 248,546, 7-18-78, Cl. D10-15.000.

Soler, Andres Navarro. Sport shoe. 248,513, 7-18-78, Cl. D2-310.000.

Streicheck, Steven G., to Parker Pen Company, The. Packaging container for a tape or the like. 248,543, 7-18-78, Cl. D9-171.000.

Summers, Kenneth L., to Rieke Corporation. Drum closure. 248,545, 7-18-78, Cl. D9-254.000.

Sunbeam Corporation: *See*—
Madl, Alfred W., 248,569, Cl. D24-41.000.

Svanstrom, Alf: *See*—
Sjostrom, Arne; and Svanstrom, Alf, 248,535, Cl. D8-14.000.

Takagi, Takeshi: *See*—
Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.

Tapdrup, Erik Peter, to Interlego A.G. Toy figure. 248,582, 7-18-78, Cl. D34-4.00R.

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Bryk, Charles S., 248,527, Cl. D7-9.000.

Thomas, Wesley L. Telephone. 248,556, 7-18-78, Cl. D14-53.000.

Tirsbier, Paul W. Outdoor light fixture. 248,594, 7-18-78, Cl. D48-35.000.

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Sekido, Iwae; and Doi, Sinichiro, 248,551, Cl. D12-211.000.

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Dibenedetto, Luigi, 248,555, Cl. D14-49.000.

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Janssens, Wilhelmus Gerardus Elisabeth, 248,575, Cl. D28-12.000.
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Byrne, David S., 248,577, Cl. D28-48.000.
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Watson, Covington B. Combined heat exchanger and fireplace grate or the like. 248,565, 7-18-78, Cl. D23-94.000.

Weis, Karl: *See*—
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ISSUED JULY 18, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

10 4,100,619
102 4,100,620
114 4,100,621
115 4,100,622
158 4,100,623
409 4,100,624
410 4,100,625

CLASS 3

1.91 4,100,626
36 4,100,627

CLASS 4

185 S 4,100,628
295 4,100,629

CLASS 5

66 4,100,630
239 4,100,631
334 R 4,100,632
337 4,100,633
365 4,100,634
368 4,100,635

CLASS 7

158 4,100,636
4,100,637

CLASS 8

4 4,101,269
17 4,101,270
94.26 4,101,271
127.6 4,101,272
172 R 4,101,273
173 4,101,274

CLASS 10

15 4,100,638

CLASS 11

1 R 4,100,639
4,100,640

CLASS 13

1 4,101,724
18 4,101,725
29 4,101,726

CLASS 15

1.7 4,100,641
114 4,100,642
246 4,100,643
397 4,100,644

CLASS 16

2 4,100,645
54 4,100,646
139 4,100,647
163 4,100,648

CLASS 19

0.2 4,100,649
105 4,100,650
145.5 4,100,651

CLASS 23

230 B 4,101,276
230 R 4,101,275
232 C 4,101,278
232 R 4,101,277
254 R 4,101,282
259 4,101,279
4,101,283
4,101,284
270 B 4,101,285
283 4,101,286
288 B 4,101,288
288 E 4,101,289
288 FC 4,101,280
288 K 4,101,281
4,101,287
288 R 4,101,290

CLASS 24

3 J 4,100,653
3 R 4,100,652
20 R 4,100,654
163 K 4,100,655
205.16 C 4,100,656
230 AL 4,100,657
231 4,100,658

CLASS 28

255 4,100,659
271 4,100,660

CLASS 29

33 K 4,100,661
110 4,100,662
156.4 R 4,100,663
156.6 4,100,664
252 4,100,665
407 4,100,666
429 4,100,667
520 Re.29,702
523 4,100,668
527.6 4,100,669
564.1 4,100,670
568 4,100,671
577 C 4,100,672
611 4,100,673
623.5 4,100,674
627 4,100,675

CLASS 30

292 4,100,676
321 4,100,677

CLASS 32

14 A 4,100,678
32 4,100,679

CLASS 33

126.7 A 4,100,680
389 4,100,681

CLASS 34

22 4,100,682
124 4,100,683

CLASS 35

62 4,100,684

CLASS 36

3 B 4,100,685
29 4,100,686

CLASS 37

43 K 4,100,687
117.5 4,100,688

CLASS 40

2.2 4,100,689
154 4,100,690

CLASS 42

1 D 4,100,691
1 L 4,100,692
1 N 4,100,693
90 4,100,694

CLASS 43

19.2 4,100,695

CLASS 44

17 4,101,291
40 4,101,292
51 4,101,293

CLASS 46

40 4,100,696
269 4,100,697

CLASS 47

29 4,100,698
81 4,100,699

CLASS 48

77 4,101,294
99 4,101,295

CLASS 51

92 R 4,100,700
157 4,100,701
216 H 4,100,702

CLASS 52

16 4,100,703
65 4,100,704
82 4,100,705
101 4,100,706
115 4,100,707
222 4,100,708
239 4,100,709
309.9 4,100,710
489 4,100,711
514 4,100,712
648 4,100,713
741 4,100,714

CLASS 53

48 4,100,715
138 A 4,100,716
138 R 4,100,717
234 4,100,718
241 4,100,719

CLASS 55

33 4,101,296
43 4,101,297
163 4,101,298
222 4,101,299

CLASS 56

14.6 4,100,720

CLASS 57

34 AT 4,100,721
34 B 4,100,723
34 R 4,100,722
35 4,100,724
140 J 4,100,725
157 F 4,100,726
160 4,100,727

CLASS 58

74 4,100,728

CLASS 59

86 4,100,729

CLASS 60

39.05 4,100,730
39.15 4,100,731
39.36 4,100,732
39.74 B 4,100,733
276 4,100,735
278 4,100,734
4,100,736
292 4,100,737
327 4,100,738
413 4,100,739
431 4,100,740
517 4,100,741
602 4,100,742
639 4,100,743
651 4,100,744
652 4,100,745

CLASS 61

1 F 4,100,746
5 4,100,747
45 B 4,100,748
45 C 4,100,749
53.64 4,100,750
72.2 4,100,751
86 4,100,752
4,100,753
98 4,100,754

CLASS 62

2 4,100,755
4,100,756
52 4,100,757
54 4,100,758
55 4,100,759
57 4,100,760
137 4,100,761
160 4,100,762
238 4,100,763
289 4,100,764
499 4,100,765

CLASS 65

2 4,101,300
21 4,101,301
30 R 4,101,302
31 4,101,303
135 4,101,304
145 4,101,305
323 4,101,306

CLASS 66

64 4,100,766
75.2 4,100,767
4,100,768
177 4,100,769
193 4,100,770

CLASS 69

33 4,100,771
47 4,100,772
48 4,100,773

CLASS 70

3 4,100,775
303 A 4,100,776
363 4,100,777
380 4,100,774
406 4,100,778
456 R 4,100,779

CLASS 71

88 4,101,307
93 4,101,308

CLASS 72

7 4,100,780
41 4,100,781
53 4,100,782
56 4,100,783
98 4,100,784
189 4,100,785
252 4,100,786
310 4,100,787
329 4,100,788

CLASS 73

23 4,100,789
23.1 4,100,790
37.7 4,100,791
39 4,100,792
118 4,100,793
136 A 4,100,794
146 4,100,795
160 4,100,796
194 E 4,100,797
4,100,798
197 4,100,799
4,100,800
202 4,100,801
215 4,100,802
230 4,100,803
363.9 4,100,804
421 B 4,100,805
421.5 A 4,100,806
492 4,100,807
588 4,100,808
638 4,100,809
647 4,100,810
654 4,100,811
732 4,100,812

CLASS 74

5 F 4,100,813
43 4,100,814
60 4,100,815
89.14 4,100,816
111 4,100,817
230.17 E 4,100,818
245 R 4,100,819
489 4,100,820
606 R 4,100,821
674 4,100,822
863 4,100,823

CLASS 75

0.5 4,101,311
0.5 AB 4,101,309
0.5 B 4,101,310
52 4,101,312
60 4,101,313
77 4,101,314
104 4,101,315
129 4,101,316
156.5 4,101,317
240 4,101,318
252 4,101,319

CLASS 81

121 R 4,100,824

CLASS 82

3 4,100,825
25 4,100,826
38 A 4,100,827

CLASS 83

1 4,100,828
106 4,100,829
371 4,100,830

CLASS 84

1.01 4,100,831
313 4,100,832

CLASS 85

3 S 4,100,833
77 4,100,834

CLASS 87

1 4,100,835

CLASS 89

7 4,100,836

CLASS 90

11 R 4,100,837

CLASS 91

1 4,100,838
369 B 4,100,839
491 4,100,840

CLASS 93

1 G 4,100,841
39 C 4,100,842
53 M 4,100,843
59 ES 4,100,844
77 FT 4,100,845
94 R 4,100,846

CLASS 96

1.4 4,101,320
1.5 R 4,101,321
33 4,101,322
35 4,101,323
36.3 4,101,324
48 R 4,101,325
67 4,101,326
115 P 4,101,327

CLASS 98

115 LH 4,100,847

CLASS 99

353 4,100,848

CLASS 100

41 4,100,849
287 4,100,850

CLASS 101

248 4,100,851
295 4,100,852
401.1 4,100,853
415.1 4,100,854

CLASS 102

48 4,100,855
206 4,100,856

CLASS 105

323 4,100,857

CLASS 106

22 4,101,329
45 4,101,330
73.1 4,101,331
85 4,101,332
4,101,333
99 4,101,334
4,101,335
101 4,101,337
106 4,101,336

CLASS 108

48 4,100,858
51.3 4,100,859

CLASS 109

83 4,100,860

CLASS 111

7 4,100,861
52 4,100,862

CLASS 112

79 R 4,100,863
121.11 4,100,864
4,100,865
231 4,100,866
270 4,100,867
277 4,100,868

CLASS 113

18 R 4,100,869

CLASS 114

39 4,100,870
51 4,100,871
73 4,100,872
125 4,100,873
162 4,100,874
251 4,100,875
274 4,100,876

CLASS 115

11 4,100,877

CLASS 116

114 AD 4,100,878

CLASS 118

49.1 4,100,879
234 4,100,880
319 4,100,881
620 4,100,882
630 4,100,883
653 4,100,884

CLASS 119

73 4,100,885
98 4,100,886

CLASS 122

379 4,100,887
438 4,100,888
510 4,100,889

CLASS 123

32 EB 4,100,891
32 EE 4,100,892
103 B 4,100,893
117 A 4,100,894
117 R 4,100,895
119 B 4,100,898
119 EC 4,100,897
119 EE 4,100,896
122 A 4,100,899
124 R 4,100,900
139 AQ 4,100,903
139 AW 4,100,901
4,100,904
139 BC 4,100,902
140 R 4,100,890
141 4,100,905
148 E 4,100,906
4,100,908
148 S 4,100,907
196 AB 4,100,909
196 S 4,100,910
205 4,100,911

CLASS 126

43 4,100,912
121 4,100,913
270 4,100,914
271 4,100,915

CLASS 127

46 B 4,101,338

CLASS 128

2 E Re.29,703
2 V 4,100,916
66 4,100,917
80 F 4,100,918
84 B 4,100,919
172.1 4,100,920
284 4,100,921
4,100,922
348 4,100,923
510 4,100,924

CLASS 133

3 F 4,100,925

CLASS 134

2 4,101,339
11 4,101,340
64 R 4,100,926

CLASS 136

89 TF 4,101,341
228 4,101,342
230 4,101,343

CLASS 137

9 4,100,927
15 4,100,928
4,100,929
68 R 4,100,930
77 4,100,931
488 4,100,932

495 4,100,933
512 4,100,934
533.11 4,100,935
596.16 4,100,937
596.2 4,100,936
625.31 4,100,938
627.5 4,100,939
877 4,100,940

CLASS 139

1 R 4,100,942
201 4,100,943
291 C 4,100,945
4,100,946
439 4,100,944
449 4,100,941
453 4,100,947

CLASS 141

392 4,100,948

CLASS 144

3 R 4,100,949
242 D 4,100,950
309 AC 4,100,951
314 B 4,100,952

CLASS 148

1.5 4,101,344
6.15 R 4,101,345
6.27 4,101,346
38 4,101,347
105 4,101,348
175 4,101,349
4,101,350
188 4,101,351

CLASS 149

19.2 4,101,352

CLASS 150

0.5 4,100,953

CLASS 151

41.7 4,100,954

CLASS 152

362 CS 4,100,955
427 4,100,956

CLASS 156

49 4,101,353
60 4,101,354
66 4,101,355
71 4,101,356
159 4,101,357
167 4,101,358
179 4,101,359
200 4,101,360
235 4,101,362
250 4,101,361
4,101,363
286 4,101,364
294 4,101,365
378 4,101,366
471 4,101,367
503 4,101,368
510 4,101,369
555 4,101,370
560 4,101,371
580 4,101,372
659 4,101,373

CLASS 160

368 R 4,100,957

CLASS 162

306 4,101,374

CLASS 164

7 4,100,958
56 4,100,959
119 4,100,960
131 Re.29,704
180 4,100,961
435 4,100,962

CLASS 165

14 4,101,886
17 4,100,963
40 4,100,964
119 4,100,965

CLASS 166

68 4,100,967
273 4,100,966
315 4,100,968
324 4,100,969

CLASS 169

57 4,100,970

CLASS 172

547 4,100,971

CLASS 173

23 4,100,972
44 4,100,973
49 4,100,974
91 4,100,975
133 4,100,976
134 4,100,977

CLASS 174

28 4,101,727
29 4,101,728
65 R 4,101,729
75 R 4,101,730
126 S 4,101,731

CLASS 175

4.55 4,100,978
19 4,100,979
4,100,980
60 4,100,981
206 4,100,982
383 4,100,983

CLASS 176

37 4,101,375
39 4,101,376
40 4,101,377

CLASS 177

50 4,100,984
189 4,100,985

CLASS 178

53.1 R 4,101,732
58 R 4,101,733
68 4,101,734

CLASS 179

1 E 4,101,736
1 HF 4,101,735
15 A 4,101,739
15 AT 4,101,737
15 FD 4,101,738
99 4,101,740
4,101,741
100.1 C 4,101,742
175 4,101,743

CLASS 180

6.2 4,101,004
75 4,100,986
4,100,987
4,100,988
127 4,100,989
135 4,100,990

CLASS 181

117 4,100,991
166 4,100,992
213 4,100,993
261 4,100,994

CLASS 182

1 4,100,995
3 4,100,996
90 4,100,997
116 4,100,998
122 4,100,999

CLASS 184

1.5 4,101,000
6.4 4,101,001
15 B 4,101,002
106 4,101,003

CLASS 187

17 4,101,005
29 R 4,101,007
4,101,013

CLASS 188

1 B 4,101,008
4,101,009
79.5 GT 4,101,011
79.5 P 4,101,010
290 4,101,012

CLASS 191

62 4,101,014

CLASS 192

106.2 4,101,015

CLASS 194

97 A 4,101,016

CLASS 195

51 G 4,101,378
62 4,101,379
63 4,101,380
99 4,101,381
103.5 R 4,101,383
103.5 UR 4,101,382
142 4,101,384

CLASS 198

300 4,101,019
478 4,101,020
668 4,101,021

CLASS 200

50 AA 4,101,744
61.61 4,101,745
82 B 4,101,746
83 A 4,101,747
148 A 4,101,748
317 4,101,749

CLASS 204

20 4,101,385
32 R 4,101,386
43 T 4,101,387
4,101,388
44 4,101,389
57 4,101,390
59 R 4,101,391
4,101,392
67 4,101,393
77 4,101,394
98 4,101,395
157.1 R 4,101,396
158 HA 4,101,397
159.16 4,101,398
159.19 4,101,399
180 G 4,101,401
180 R 4,101,400
192 C 4,101,402
195 S 4,101,403
4,101,404
224 M 4,101,405
239 4,101,406
251 4,101,407
272 4,101,408
277 4,101,409
282 4,101,410
298 4,101,411

CLASS 206

45.14 4,101,022
45.19 4,101,023
102 4,101,024
205 4,101,026
309 4,101,027
311 4,101,028
315 B 4,101,029
377 4,101,025
398 4,101,030
438 4,101,031
457 4,101,032
521 4,101,033
531 Re.29,705
612 4,101,034

CLASS 208

8 4,101,412
4,101,413
18 4,101,414
45 4,101,415
108 4,101,416
120 4,101,417
139 4,101,418

CLASS 209

13 4,101,419
104 4,101,420
114 4,101,035

CLASS 210

84 4,101,422
178 4,101,421
494 M 4,101,423

CLASS 211

86 4,101,036
167 4,101,037

CLASS 214

44 R 4,101,038
83.32 4,101,039
131 R 4,101,040

CLASS 215

6 4,101,041
11 R 4,101,042
100 R 4,101,043
228 4,101,044

CLASS 219

10.55 C 4,101,750
74 4,101,751
91.2 4,101,752
97 4,101,753
121 P 4,101,754
124.31 4,101,755
222 4,101,756
225 4,101,757
285 4,101,758
343 4,101,759
544 4,101,760

CLASS 220

90 4,101,046
258 4,101,047
404 4,101,045

CLASS 221

232 4,101,053
278 4,101,054

CLASS 222

17 4,101,055
26 4,101,056
207 4,101,057
274 4,101,058

CLASS 223

85 4,101,059

CLASS 224

2 B 4,101,060
42.1 F 4,101,061

CLASS 227

19 4,101,063
53 4,101,064

CLASS 228

155 4,101,065
180 R 4,101,066
222 4,101,067

CLASS 229

2.5 R 4,101,049
3.5 R 4,101,050
17 R 4,101,051
23 R 4,101,052
34 R 4,101,048
35 4,101,068
40 4,101,069

CLASS 233

1 R 4,101,070

CLASS 235

92 CA 4,101,761
92 MT 4,101,071
95 C 4,101,762
455 4,101,072

CLASS 239

14 4,101,073
101 4,101,075
584 4,101,076
585 4,101,074
598 4,101,077
651 4,101,078

CLASS 241

46.15 4,101,079
51 4,101,080
101.7 4,101,081
282.1 4,101,082
285 R 4,101,083

CLASS 242

7.11 4,101,084
18 G 4,101,085
18 PW 4,101,086
84.2 A 4,101,087
85 4,101,088
85.1 4,101,089
96 4,101,090
107 4,101,091
107.4 A 4,101,093
4,101,094
107.4 B 4,101,092
115 4,101,095
199 4,101,096
205 4,101,097

CLASS 244

63 4,101,098
4,101,099
114 R 4,101,100
173 4,101,101

CLASS 248

20 4,101,102
58 4,101,103
95 4,101,104
158 4,101,105
188.9 4,101,106
218.4 4,101,107
243 4,101,108
317 4,101,109
395 4,101,110

CLASS 249

205 4,101,111

CLASS 250

214 R 4,101,763
237 G 4,101,764
251 4,101,765
320 4,101,766
339 4,101,767
360 4,101,768
361 R 4,101,769
363 S 4,101,770
397 4,101,771
399 4,101,772
401 4,101,773
402 4,101,774
409 4,101,775
416 TV 4,101,776
436 4,101,777
441 4,101,778
445 R 4,101,779
475 4,101,780
483 4,101,781
492 B 4,101,782
504 4,101,424
540 4,101,783
555 4,101,784
574 4,101,785

CLASS 251

148 4,101,112
214 4,101,113

CLASS 252

8.55 C 4,101,425
4,101,426
32.7 E 4,101,427
4,101,428
4,101,429
42.7 4,101,430
46.7 4,101,431
49.5 4,101,433
49.8 4,101,432
52 R 4,101,434
62.2 4,101,458
62.53 4,101,435
67 4,101,436
149 4,101,437
151 4,101,438
182 4,101,439
4,101,515
186 4,101,440
358 4,101,442
4,101,443
389 A 4,101,441
411 R 4,101,444
429 R 4,101,445
430 4,101,446
431 C 4,101,447
437 4,101,448
457 4,101,449
460 4,101,450
465 4,101,451
501 4,101,452
503 4,101,453
514 4,101,454
531 4,101,455
551 4,101,456
559 4,101,457

CLASS 254

134.3 FT 4,101,114

CLASS 256

13.1 4,101,115

CLASS 260

2.3 4,101,463
13 4,101,473
4,101,474
18 EP 4,101,459
21 4,101,475
22 CB 4,101,477
22 EP 4,101,476
23 AR 4,101,480
23 H 4,101,479
23 S 4,101,478
23.7 A 4,101,481
27 BB 4,101,482
4,101,483
4,101,484
29.2 N 4,101,487
4,101,488
29.2 TN 4,101,486
29.3 4,101,489
29.4 UA 4,101,485
29.6 B 4,101,494
29.6 MP 4,101,490
29.6 NR 4,101,492
29.6 R 4,101,493
29.6 T 4,101,491
29.7 NR 4,101,495
31.2 N 4,101,497
31.2 R 4,101,496
33.6 AQ 4,101,498
37 SB 4,101,499
38 4,101,500
40 R 4,101,501
4,101,502
42.18 4,101,503
4,101,504
4,101,505
45.75 B 4,101,510
45.75 N 4,101,509
45.75 R 4,101,528
45.8 N 4,101,506
4,101,507
4,101,508
45.85 T 4,101,511
45.95 C 4,101,512
97.7 4,101,535
112.5 LH 4,101,537
4,101,538
112.5 R 4,101,536
4,101,539
147 4,101,540
158 4,101,541
4,101,542
162 4,101,543
207.1 4,101,544
239.5 4,101,545
283 SA 4,101,551
285.5 4,101,552
288 CF 4,101,553
290 HL 4,101,554
293.85 4,101,555
307 C 4,101,556
327 E 4,101,557
328 4,101,558
347.3 4,101,559
348.29 4,101,560
396 N 4,101,561
419 4,101,562
425 4,101,563
429.7 4,101,564
4,101,565
438.5 R 4,101,567
439 R 4,101,566
448 A 4,101,568
463 4,101,569
502 R 4,101,570
543 H 4,101,572
543 P 4,101,573
543 R 4,101,571
544 L 4,101,574
553 E 4,101,575
559 A 4,101,576
559 R 4,101,579
561 R 4,101,577
563 P 4,101,580
563 R 4,101,578
566 B 4,101,581
574 4,101,582
575 4,101,583
590 D 4,101,584
592 4,101,585
593 R 4,101,586
606.5 F 4,101,587
615 A 4,101,588
615 B 4,101,589
649 F 4,101,591
666 A 4,101,593
666 P 4,101,592
668 A 4,101,594
4,101,595
4,101,596
4,101,597
4,101,598
683.15 D 4,101,600
683.9 4,101,599
836 4,101,601
839 4,101,602
850 4,101,603
857 TW 4,101,534
857 UN 4,101,606
862 4,101,604
873 4,101,605

CLASS 261

36 R 4,101,607
4,101,608
105 4,101,609
110 4,101,610
142 4,101,611

CLASS 264

22 4,101,612
40.3 4,101,613
40.6 4,101,614
63 4,101,615
65 4,101,616
93 4,101,617
97 4,101,618
156 4,101,619
177 R 4,101,620
182 4,101,621
251 4,101,622
270 4,101,623
273 4,101,624
287 4,101,625
313 4,101,626
323 4,101,627
325 4,101,628

CLASS 267

136 4,101,117
4,101,118

CLASS 269

203 4,101,119
323 4,101,120

CLASS 270

68 A 4,101,121

CLASS 271

277 4,101,122

CLASS 272

75 4,101,123
97 4,101,136
134 4,101,124

CLASS 273

29 A 4,101,132
75 4,101,125

95 B 4,101,127
95 R 4,101,126
106 A 4,101,128
143 R 4,101,129
187 A 4,101,130
239 4,101,131

CLASS 274

23 R 4,101,133
4,101,134
39 A 4,101,135

CLASS 277

1 4,101,137
11 4,101,138
22 4,101,139
165 4,101,140

CLASS 279

19 4,101,141

CLASS 280

16 4,101,142
42 4,101,143
423 B 4,101,144
605 4,101,145
731 4,101,146
775 4,101,147

CLASS 285

13 4,101,148
55 4,101,149
226 4,101,150
236 4,101,151

CLASS 289

17 4,101,152

CLASS 292

92 4,101,153
237 4,101,154
256.69 4,101,156
347 4,101,155

CLASS 294

86.21 4,101,157

CLASS 296

10 4,101,158
35 R 4,101,160
37.7 4,101,062
4,101,159
137 B 4,101,162
137 H 4,101,161

CLASS 297

16 4,101,163
159 4,101,164
273 4,101,165
304 4,101,166
328 4,101,167
329 4,101,168
341 4,101,169
389 4,101,170
4,101,171

CLASS 299

2 4,101,172
33 4,101,173

CLASS 302

11 4,101,174
53 4,101,175

CLASS 303

6 C 4,101,176

CLASS 305

31 4,101,177

CLASS 307

38 4,101,786
81 4,101,787
205 4,101,788
220 R 4,101,789
221 C 4,101,790
308 4,101,791

CLASS 308

3.6 4,101,178
4 A 4,101,179
20 4,101,180
36 4,101,181

CLASS 310

15 4,101,792
52 4,101,793
71 4,101,794
336 4,101,795

CLASS 312

8 4,101,182
195 4,101,183
233 4,101,184

CLASS 313

141 4,101,797
178 4,101,796
315 4,101,798
331 4,101,799
346 DC 4,101,800
417 4,101,801
422 4,101,802

CLASS 315

3 4,101,803
3.5 4,101,804
74 4,101,805
86 4,101,806
116 4,101,807
151 4,101,808
156 4,101,809
169 TV 4,101,810
200 R 4,101,811
241 P 4,101,812
370 4,101,813
371 4,101,814
411 4,101,815

CLASS 316

19 4,101,185

CLASS 318

130 4,101,816
603 4,101,817

CLASS 320

2 4,101,818

CLASS 323

24 4,101,819
94 R 4,101,820
119 4,101,821

CLASS 324

16 R 4,101,822
20 CR 4,101,823
20 R 4,101,824
32 4,101,825
51 4,101,826
65 R 4,101,827
4,101,828
126 4,101,829
158 F 4,101,830
166 4,101,831
227 4,101,832

CLASS 325

30 4,101,833
42 4,101,834
55 4,101,835
302 4,101,836
347 4,101,837

CLASS 328

63 4,101,838
165 4,101,839

CLASS 330

127 4,101,840
254 4,101,841
257 4,101,842
280 4,101,843

CLASS 331

10 4,101,844
94.5 D 4,101,846
94.5 M 4,101,845
94.5 S 4,101,847
116 R 4,101,848

CLASS 333

14 4,101,849
24.2 4,101,850
28 R 4,101,851
30 R 4,101,852
70 R 4,101,853
82 B 4,101,854

CLASS 335

106 4,101,855
135 4,101,856
206 4,101,857
272 4,101,858

CLASS 336

90 4,101,859

CLASS 337

159 4,101,860
368 4,101,861

CLASS 338

23 4,101,862
128 4,101,863
183 4,101,864

CLASS 339

5 S 4,101,186
59 L 4,101,187
99 R 4,101,189
113 L 4,101,190
125 R 4,101,191
217 S 4,101,192

CLASS 340

1 L 4,101,865
7 R 4,101,866
15.5 TC 4,101,867
51 4,101,868
52 R 4,101,869
53 4,101,870
171 R 4,101,871
310 R 4,101,878
324 AD 4,101,879
326 4,101,880
347 P 4,101,882
347 R 4,101,881
365 R 4,101,883
366 B 4,101,884
384 E 4,101,885
504 4,101,875
539 4,101,872
4,101,873
555 4,101,876
569 4,101,877
606 4,101,874
652 4,101,887

CLASS 343

7 VM 4,101,888
7.7 4,101,889
8 4,101,890
17.2 PC 4,101,891
108 R 4,101,892
4,101,893
112 R 4,101,894
708 4,101,895
713 4,101,896
715 4,101,897
752 4,101,898
788 4,101,899
789 4,101,900
853 4,101,901
854 4,101,902

CLASS 346

33 R 4,101,903
74.1 4,101,904
4,101,905
75 4,101,906
135 4,101,907
139 C 4,101,908
153 4,101,909

CLASS 350

6.8 4,101,193
9 4,101,194
55 4,101,195
96.17 4,101,197
96.20 4,101,198
96.24 4,101,188
96.31 4,101,196
152 4,101,199
166 4,101,200
175 ML 4,101,201
187 4,101,202
217 4,101,203
224 4,101,204
289 4,101,205
4,101,206
344 4,101,207

CLASS 351

58 4,101,208

CLASS 352

91 C 4,101,209

CLASS 353

7 4,101,210

CLASS 354

42 4,101,910
53 4,101,911
106 4,101,912
122 4,101,913
128 4,101,914
144 4,101,915
219 4,101,916
273 4,101,917
286 4,101,223
299 4,101,918
319 4,101,919

CLASS 355

3 DD 4,101,211
3 TR 4,101,212
5 4,101,213
10 4,101,214
15 4,101,215
35 4,101,216
38 4,101,217
57 4,101,218

CLASS 356

89 4,101,219
105 4,101,220
205 4,101,221
244 4,101,222

CLASS 357

17 4,101,920
23 4,101,921
4,101,922
30 4,101,923
4,101,924
68 4,101,925

CLASS 358

17 4,101,926
27 4,101,927
28 4,101,928
44 4,101,929
183 4,101,930
217 4,101,931
223 4,101,932
254 4,101,933
261 4,101,934
293 4,101,935

CLASS 360

10 4,101,936
16 4,101,938
36 4,101,939
37 4,101,940
74 4,101,941
76 4,101,937
77 4,101,942
84 4,101,943
85 4,101,944
102 4,101,945
105 4,101,946
114 4,101,947
137 4,101,948
4,101,949

CLASS 361

203 4,101,950
293 4,101,951
305 4,101,952

CLASS 362

11 4,101,953
26 4,101,954
104 4,101,955
217 4,101,956
268 4,101,957

CLASS 364

200 4,101,958
4,101,959
4,101,960
413 4,101,962
417 4,101,961
705 4,101,963
724 4,101,964
821 4,101,965
841 4,101,966
900 4,101,967
4,101,968
4,101,969

CLASS 365

2 4,101,970
11 4,101,971
29 4,101,972
73 4,101,973
96 4,101,974
117 4,101,975
119 4,101,976

CLASS 366

142 4,101,116
246 4,101,977
314 4,101,978

CLASS 400

124 4,101,017
144.3 4,101,006
328 4,101,224
582 4,101,018

CLASS 401

119 4,101,225

CLASS 403

4 4,101,226
27 4,101,227
137 4,101,228
171 4,101,229
4,101,230
252 4,101,231
261 4,101,232
397 4,101,233

CLASS 404

6 4,101,234
4,101,235
25 4,101,236
98 4,101,237

CLASS 408

59 4,101,238
182 4,101,239
211 4,101,240

CLASS 415

113 4,101,241
134 4,101,242
201 4,101,243

CLASS 416

41 4,101,244
190 4,101,245

CLASS 417

48 4,101,247
171 4,101,246
204 4,101,248
269 4,101,249
4,101,250
313 4,101,251

CLASS 423

121 4,101,629
171 4,101,630
210 4,101,631
4,101,632
228 4,101,633
239 4,101,634
242 4,101,635
305 4,101,636
309 4,101,637
320 4,101,638
449 4,101,639
462 4,101,640
567 R 4,101,641
573 G 4,101,642
575 4,101,643
581 4,101,644
648 A 4,101,645

CLASS 424

4 4,101,646
5 4,101,647
9 4,101,648
12 4,101,649
35 4,101,651
44 4,101,650
49 4,101,652
177 4,101,653
200 4,101,654
204 4,101,655
246 4,101,656
4,101,657
4,101,658
248.56 4,101,659
250 4,101,660
266 4,101,661
267 4,101,662
4,101,663
273 R 4,101,664
4,101,665
275 4,101,666
4,101,667
4,101,668
286 4,101,669
300 4,101,670
301 4,101,672
312 4,101,673
325 4,101,674
326 4,101,675
330 4,101,671
4,101,676
4,101,677

CLASS 425

79 4,101,253
82.1 4,101,254
219 4,101,255
394 4,101,252
441 4,101,256

CLASS 426

50 4,101,678
53 4,101,679
96 4,101,680
387 4,101,681
482 4,101,682
618 4,101,683
625 4,101,684

CLASS 427

8 4,101,685
22 4,101,686
25 4,101,687
56 4,101,688
122 4,101,689
150 4,101,690
229 4,101,691
333 4,101,692
386 4,101,693
399 4,101,694
434 D 4,101,695

CLASS 428

1 4,101,696
9 4,101,697
31 4,101,698
36 4,101,699
131 4,101,700
189 4,101,701
213 4,101,702
216 4,101,703
218 4,101,704
220 4,101,705
294 4,101,706
409 4,101,707
432 4,101,708
433 4,101,709
472 4,101,710
474 4,101,711
547 4,101,712
554 4,101,713
624 4,101,328
639 4,101,714
652 4,101,715

CLASS 429

13 4,101,716
15 4,101,717
26 4,101,718
206 4,101,719

CLASS 431

15 4,101,257
26 4,101,258
93 4,101,259
95 R 4,101,260
202 4,101,261
344 4,101,262

CLASS 432

13 4,101,263
14 4,101,264
29 4,101,265
46 4,101,266
60 4,101,267
80 4,101,268

CLASS 521

28 4,101,460
32 4,101,461
79 4,101,467
83 4,101,469
85 4,101,472
88 4,101,464
115 4,101,462
4,101,466
4,101,468
118 4,101,465
4,101,470
121 4,101,471

CLASS 526

3 4,101,720
19 4,101,721
106 4,101,722
193 4,101,513

CLASS 528

45 4,101,530
67 4,101,529
73 4,101,527
100 4,101,518
109 4,101,514
112 4,101,516
179 4,101,526
197 4,101,519
242 4,101,521
248 4,101,520
271 4,101,517
288 4,101,524
292 4,101,522
309 4,101,523
4,101,525
311 4,101,532
315 4,101,531
491 4,101,533

CLASS 544

284 4,101,548
294 4,101,547
301 4,101,549
360 4,101,723
387 4,101,550
408 4,101,546

CLASS 568

750 4,101,590

CLASSIFICATION OF DESIGNS

D2—	269	248,511
	272	248,512
	310	248,513
	311	248,514
	400	248,515
D6—	3	248,516
		248,517
	10	248,518
	32	248,519
	63	248,520
		248,521
	72	248,522
	184	248,523
	197	248,524
	237	248,525
D7—	1	248,526
	9	248,527
	137	248,528
		248,529
		248,530
		248,531
		248,532
	151	248,533
D8—	5	248,534
	14	248,535
	21	248,536
	82	248,537
	99	248,538
	336	248,539
	346	248,540
	372	248,541
D9—	23	248,542
	171	248,543
	216	248,544
	254	248,545
D10—	15	248,546
	32	248,547
D11—	160	248,548
D12—	29	248,549
	181	248,550
	211	248,551
D14—	3	248,552
	5	248,553
	43	248,554
	49	248,555
	53	248,556
D15—	17	248,557
	32	248,558
	69	248,559
D19—	43	248,560
	69	248,561
D22—	13	248,563
	28	248,562
D23—	32	248,564
	94	248,565
D24—	8	248,566
	9	248,567
	25	248,568
	41	248,569
D25—	31	248,570
	38	248,571
D27—	03	248,572
		248,573
	05	248,574
D28—	12	248,575
		248,576
	48	248,577
		248,578
	49	248,579
D31—	24	248,580
D33—	9 C	248,588
D34—	2 R	248,581
	4 R	248,582
	14 B	248,583
	15 C	248,586
	15 P	248,585
	15 R	248,584
	41	248,587
D48—	20 R	248,589
	32 A	248,590
		248,591
	32 R	248,592
	33	248,593
	35	248,594
D64—	11 B	248,595

CLASSIFICATION OF PLANTS

P.—	12	4,281
	18	4,282
	77	4,280

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	Re.29,704		4,101,155		4,101,235		4,101,554		4,100,739		4,101,011
	4,101,187		4,101,330		4,101,276		4,101,687		4,100,756		4,101,107
	4,101,780		4,101,373		4,101,278		4,101,855		4,100,759		4,101,178
4 :	4,100,907		4,101,465		4,101,303	10 :	4,100,725		4,100,794		4,101,190
	4,101,352		4,101,757		4,101,346		4,101,358		4,100,802		4,101,433
5 :	4,101,048		4,101,816		4,101,348		4,101,528		4,100,862		4,101,487
6 :	Re.29,703		4,101,818		4,101,349		4,101,561		4,100,921		4,101,539
	4,100,635	01 :	4,100,748		4,101,354		4,101,577		4,100,949		4,101,698
	4,100,686		4,101,195		4,101,412		4,101,669		4,100,951		4,101,815
	4,100,698		4,101,753		4,101,416		4,101,710		4,100,953		4,101,823
	4,100,728	04 :	4,100,898		4,101,425		4,101,745		4,100,965		4,101,864
	4,100,782		4,100,910		4,101,426	11 :	4,100,964		4,100,984	19 :	4,100,699
	4,100,801		4,101,061		4,101,447		4,101,039		4,100,990		4,100,738
	4,101,028		4,101,844		4,101,479		4,101,895		4,101,004		4,100,899
	4,101,046		4,101,974		4,101,589		4,101,899		4,101,018		4,100,971
	4,101,060	05 :	4,100,624		4,101,644	12 :	4,100,637		4,101,026		4,101,071
	4,101,067	06 :	4,100,629		4,101,711		4,100,681		4,101,038		4,101,078
	4,101,111		4,100,641		4,101,726		4,100,689		4,101,097		4,101,298
	4,101,114		4,100,661		4,101,761		4,100,896		4,101,137		4,101,958
	4,101,135		4,100,674		4,101,765		4,100,906		4,101,147	20 :	4,100,842
	4,101,142		4,100,712		4,101,777		4,100,956		4,101,160		4,100,886
	4,101,184		4,100,742		4,101,781		4,101,049		4,101,177		4,100,917
	4,101,191		4,100,751		4,101,782		4,101,058		4,101,233		4,101,088
	4,101,198		4,100,774		4,101,786		4,101,125		4,101,251		4,101,162
	4,101,199		4,100,787		4,101,807		4,101,128		4,101,284		4,101,256
	4,101,246		4,100,807		4,101,859		4,101,130		4,101,289		4,101,828
	4,101,263		4,100,830		4,101,871		4,101,248		4,101,414	21 :	4,100,714
	4,101,291		4,100,831		4,101,874		4,101,293		4,101,418		4,101,224
	4,101,353		4,100,832		4,101,894		4,101,535		4,101,441		4,101,836
	4,101,365		4,100,833		4,101,906		4,101,607		4,101,444	22 :	4,100,753
	4,101,383		4,100,867		4,101,916		4,101,678		4,101,510		4,101,057
	4,101,401		4,100,871		4,101,919		4,101,825		4,101,527		4,101,308
	4,101,531		4,100,927		4,101,931		4,101,850		4,101,593		4,101,692
	4,101,555		4,100,928		4,101,942		4,101,885		4,101,594	24 :	4,100,694
	4,101,609		4,100,940		4,101,955		4,101,964		4,101,619		4,100,789
	4,101,611		4,100,981		4,101,957	13 :	4,100,863		4,101,677		4,100,810
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DESIGN PATENTS

4 : 248,542
5 : 248,563
6 : 248,519
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